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New Plant of National Acme Company

Shop Built for Large Production of Screw Machine Products Has Many Notable Features in Arrangement and in Convenience for Employees

THE new screw machine products plant of the National Acme Co., Cleveland, is notable for its size, up-to-date methods and convenient arrangement for large production work on automatic screw machine products. Ground space being unavailable for further extensions at its Stanton Avenue plant, this company recently built a new products plant along the New York Central Railroad, at Coit Road and East 131st Street, Cleveland, to which it moved its entire products department and is now using its old plant exclusively for the manufacturing of machinery and self-opening dies and taps.

The new plant occupies a 15-acre site, and includes a main one-story factory building of the saw-tooth roof type, with 335,000 sq. ft. of floor space, or about 7½ acres under one roof. With other buildings the total floor space is approximately 8½ acres. The size of the plant is indicated by the fact that it is equipped with 1800 machines, including 600 Acme and Gridley automatics of various sizes, and the average production per month exceeds 50,000,000 pieces.

The plant is laid out for economical production by the reduction to a minimum of the distance of hauling material in the process of manufacture. Long hauls are eliminated by the direct routing of material. The general direction of stock in the process of manufacture is crossways through the plant, from the raw stock room on one side to the shipping department on the opposite side. A great saving in the length of truck hauls and in aggregate haulage has been effected by having a centrally located cleaning department, and adjoining that a clearing house, from which parts go either to the storage and shipping departments adjoining or back to machines for secondary operations.

One of the outstanding features of the plant is its heating and ventilating system. Washed warm air is circulated by a fan system through the factory buildings for heating, this being supplemental to steam radiation, and the foul air is exhausted by another fan system. When heat is not required, the blower system is kept in operation for ventilation.

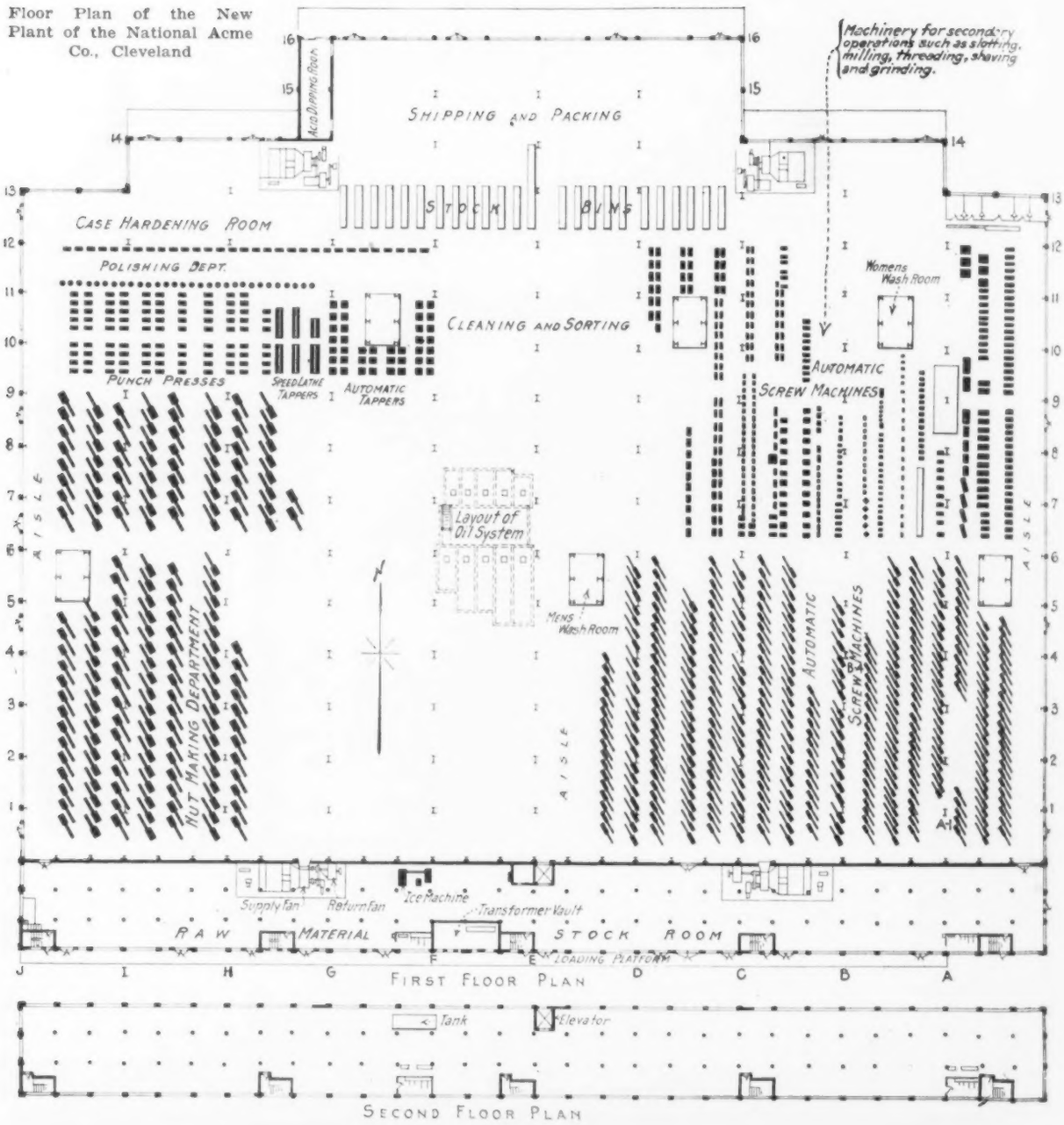
Another feature of the plant is the almost complete elimination of wood in the building and equipment, about the only wood used being for the factory floors. The factory offices have steel and glass partitions, one-half steel, one-half glass, and the storage bins for finished product, tool crib equipment, foremen's desks, sorting tables, lockers, etc., are of steel.

The main building is approximately 600 x 480 ft. To this a two-story concrete building, 600 x 52 ft., is connected. The first floor of the latter building is used for stock room, and the second for the tool room. The main building is of brick, steel and glass and steel sash construction, with stone trimmings. Good lighting is provided throughout by an abundance of outside window space and the glass in the saw-tooth building. The roof of this building is made in 16 saw-tooth sections, 30 ft. wide, with the sloping side facing the north glazed with factory ribbed glass. The saw-tooth roof truss is formed so that the windows in the roof are at an angle of 30 deg. With the sloping windows the amount of outside light is largely increased over the amount that would come in through windows located vertically.

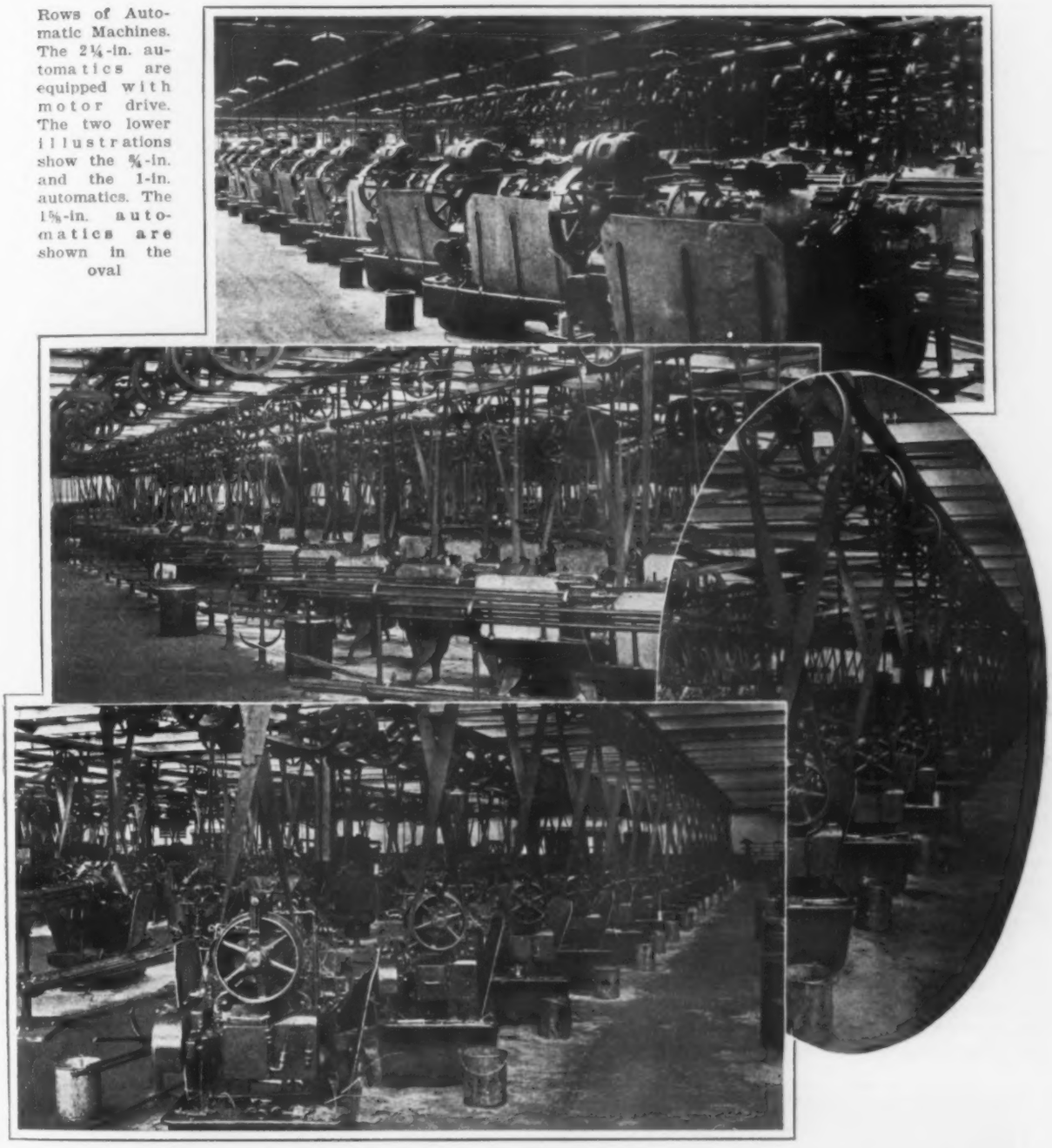
Another interesting feature is the spacing of the building columns. One way the columns are 30 ft. apart, corresponding with the roof sections, and lengthwise they are spaced 60 ft. Clear glass is used in the side walls. There are 140,000 sq. ft. of side wall sash, and in the saw-tooth roof 105,000 sq. ft. of ventilating sash and 10,000 ft. of window operators. The sash are of the Fenestra type. In the side wall sash there are 25,000 sq. ft. of crystal sheet plate glass. A wood floor is used throughout, 38,000 sq. yd., or 94 carloads of block, being required. The floor is laid on a concrete base, which is 12 in. in thickness in some parts of the plant where the heavier machinery is installed.

Aisles, 20 ft. in width, are provided along the outer walls, and there are other aisles through the center, both crossways and lengthways. The 60 x 30-ft. bays are lettered one way and numbered the other way, as shown on the layout, the main building being divided into 180 blocks. This plan was adopted solely to conveniently locate one section or piece of machinery. The

Floor Plan of the New Plant of the National Acme Co., Cleveland



Battery of Oil Extractors in Which the Oil Is Separated from the Parts and the Chips. The work is brought to the extractors from the automatic machines in the pails shown



Rows of Automatic Machines. The 2¼-in. automatics are equipped with motor drive. The two lower illustrations show the ¾-in. and the 1-in. automatics. The 1⅝-in. automatics are shown in the oval

symbols indicating the bays or blocks are prominently posted on the columns, as A1, B4, etc.

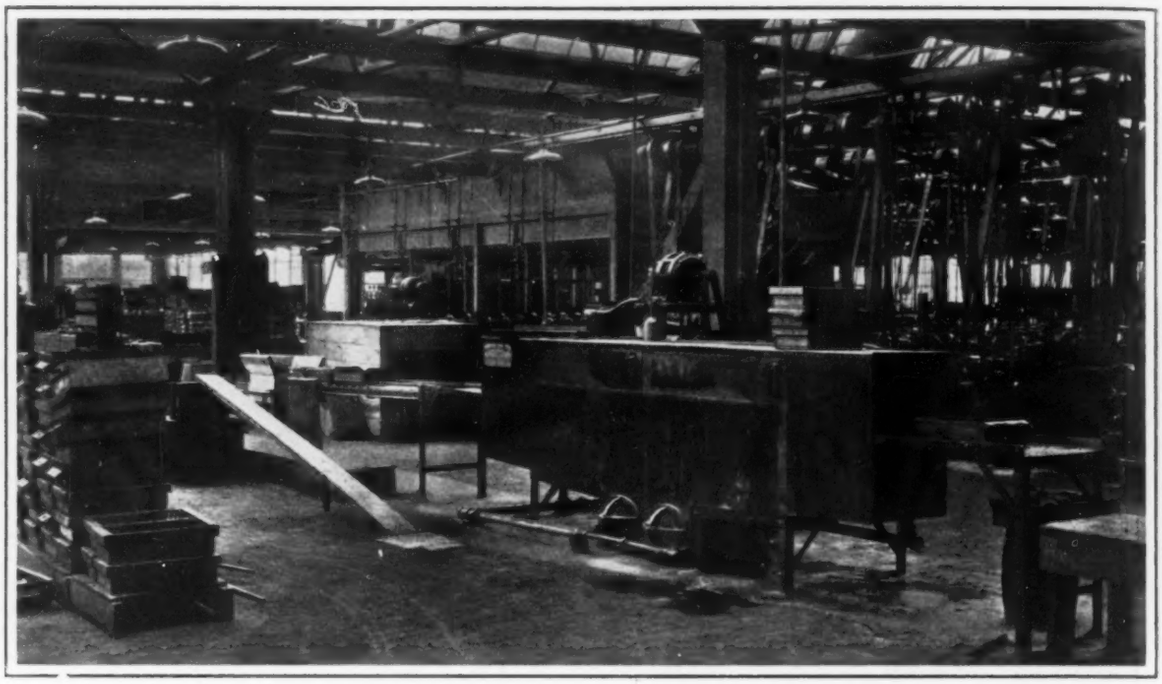
The automatic screw machines occupy about two-thirds of the south half of the building and adjoining these, across the aisle on the opposite north side, are the machines for the secondary operation, such as slotting, milling, threading, shaving and grinding. The general layout of the rows of machinery is indicated in the drawing. The machines start on the outside with the 9/16 in., or smallest size of automatic, and the sizes gradually increase up to 2¼-in. machines in the last rows. At the other end of the plant is the nut-making department, the product of which is largely castellated nuts. This department occupies about one-third of the building on the west side, and is equipped with batteries of nut-tapping machines and other nut-making equipment.

A great deal of the machinery equipment was installed during the rush of the war-time period, and belt drive was used throughout, but this is now being replaced by individual motor drive, which will be used for all of the automatic machines. In the secondary operation department individual motor drive will be used as far as is practicable, and in some cases group motor drive.

The cleaning and sorting department and clearing house are located between the automatic machine and nut departments, and adjoining these are the stock bins and packing and shipping departments.

In the raw material stock room in the building on the south, adjoining the main factory building, large storage capacity is provided in two rows of bins, 131 bins in all, that are divided into three sections and extend the length of the 600-ft. room, along the walls, with a wide aisle down the center. The bins are built of 4-in. pipe posts, 4 ft. 4 in. high, set in cast-iron bases that fit on a bottom support. This support is built of two channel irons bolted together, but slightly separated by pieces of plate at the end. The bins are adjustable for width by loosening bolts that hold the bases to the channel. On the posts are painted the number of the bin with the kind and size of bar stock.

An unloading platform and railway siding extends the full length of the plant, adjoining the stock room, the platform being on a car floor level. This platform has a capacity for handling 12 cars of material at one time. The platform and siding are used almost wholly for the incoming raw material, but when shipments of finished parts are made in carload lots, as is done for one large consumer, and for the company's Chicago and New York warehouses, the product is carried in electric trucks across the plant to this platform. Smaller lots are hauled in motor trucks from a covered shipping platform on the opposite side to freight depots.



After the Oil Is Extracted from the Work and the Chips Are Separated from the Parts, the Parts Pass Through the Steam Washing Machines for Removal of Oil and Dirt

Steel bars and other raw material are unloaded from the cars upon trucks or trailers, which are hauled into the stock room with electric tractors. From the trucks, material is handled to and from the bins with electric hoists, three 3-ton Shepard hoists being provided for this purpose, one over each section. The hoist runways with necessary switches extend over all the bins and through the center aisle, affording a convenient and flexible handling system. The hoists are equipped with grappling hooks for handling the steel, which is weighed before being placed in the bins and again when being sent to the manufacturing department.

There are 12 doors between the stock room and the unloading platform on the incoming stock side, and five doors lead from the stock room to the adjoining factory building. The stock room is provided with 12 machines for pointing the bars before going to the automatic machines, a cut-off saw and emery wheels. The electric tractors and trailers are also used for hauling the stock from the stock room to the machines.

The day's work is taken from the automatic machines to the cleaning department at night. Here the pails of parts and turnings are piled up. The gross product for 10 hr. fills 4500 pails, and it requires a night gang of 20 men to truck these to the cleaning department. In the morning the oil is separated from the work in oil extractors, 12 of which are provided. From the oil extractors the work is dumped into power-operated separators of a special design for removing the chips from the parts. There are seven of these separators, which have perforated sheet metal screens through which the fine chips pass while the work is being shaken on the screen. The larger pieces of turnings are picked out by hand by the operator during the shaking movement. When the chips or turnings are separated from the parts, the latter are dumped from the lower end of the shaker into sheet metal shop boxes.

After Being Cleaned the Parts Go to the Sorting Department, Which Is Equipped with Specially Designed Individual Tables Made of Sheet Metal

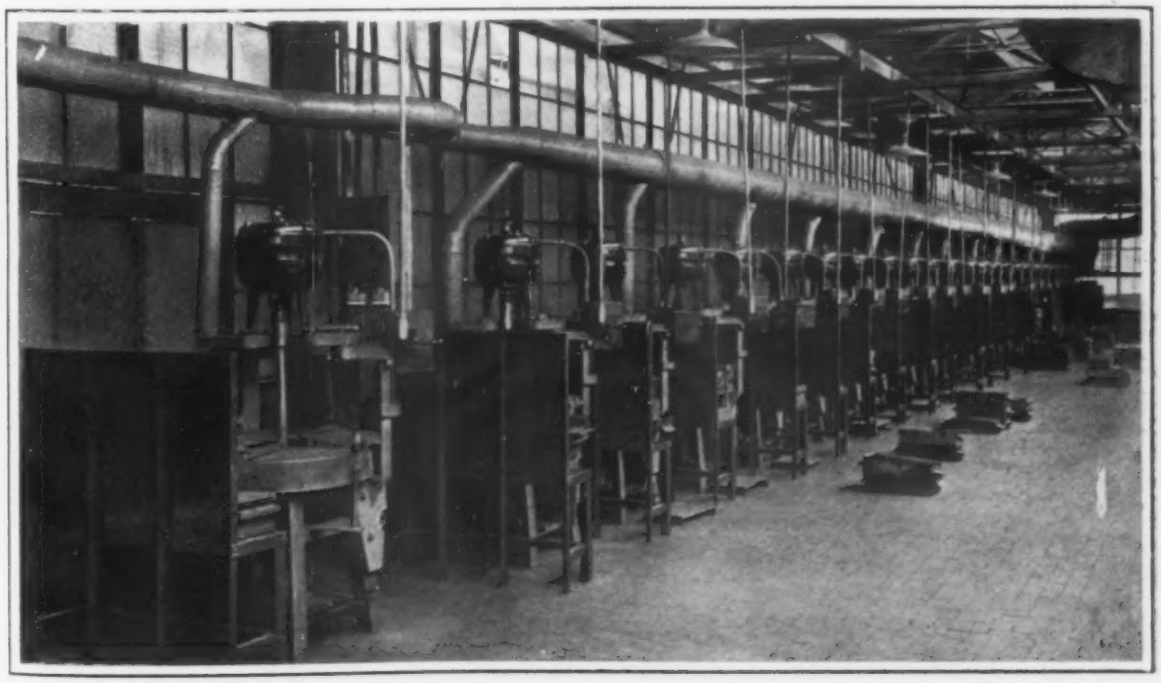
View of the Stock Bins and Method of Handling Material

From the separators the parts go to Niagara steam washers, three of which are used for cleaning the parts. Before entering the washers the parts are dumped into perforated bottom shop boxes, and the oil and dirt are cleaned from the work as the boxes pass through the cleaning machine on a conveyor. On leaving the steam cleaner the boxes are pushed along a roller conveyor and the contents are dumped back into the original boxes, which are of the same size, but not perforated, and a coating of light oil is sprayed on the work to keep it from rusting. After cleaning, the parts go to the clearing house adjoining, where they are sorted and weighed. If a secondary operation is required, they are then sent to the secondary operation department. If they are not to be given a second operation, they are inspected after sorting and go directly to the shipping department, where another inspection takes place. If they are to be hardened and ground they are sent to the hardening department and back for sorting and inspection before going to the shipping department.

Each sorter has a sheet metal table with a 36 x 36-in. top. Good parts are pushed into a trough attached to the front of the table and run into boxes. As the boxes are filled they are piled on a platform at the side of the table, and when the platform is loaded, it is carried away by an elevating platform truck. The sorting department requires a force of 160 employees, mostly women. About 15,000 boxes of product go through the clearing house daily. The plant operation requires the use of 25,000 shop boxes.

The scrap in the form of turnings, amounting to 50 tons per day, is placed in dump hopper trucks, which are hauled by tractor to an outside concrete pit, from which it is loaded on cars with a locomotive crane equipped with a grab bucket. The method of handling scrap in this plant was described in THE IRON AGE of March 20, 1919.

An important advantage of the plan of handling the work through the clearing house is that a constant check is kept on production and shortages. As every



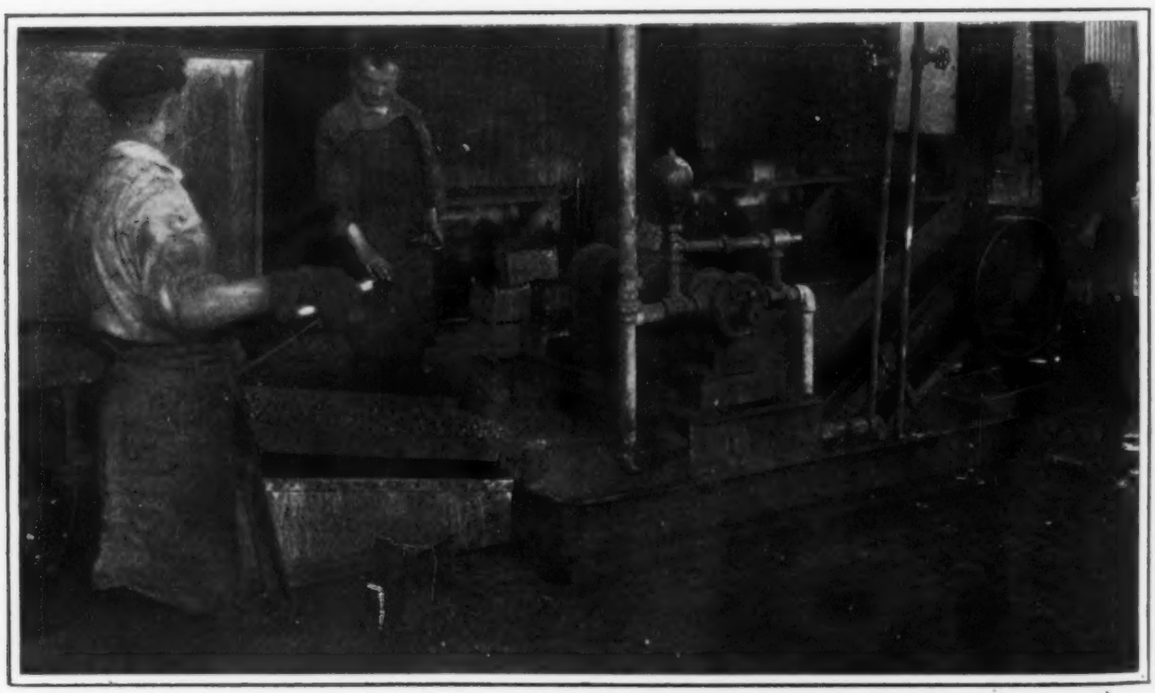
View of Polishing Department Showing Special Flat-Wheel Polishing Machines Driven by Individual Motors for Polishing Cap Screws

In Front of the Case Hardening Furnaces Are Hoods for Carrying Away the Heat and Fumes, Which Are Prevented from Passing Out into the Room by Screens Composed of Small Chain

day's product goes to the clearing house the next day and from there on to the secondary operation machines, if additional operations are necessary, the only work that is in process in any department is the current day's production. Consequently an inventory of the job can be taken in 2 hr. A record is kept of the pieces that are scrapped on the job on the automatic and secondary operating machines every day, and if there are shortages due to scrapping of work, these are known at once and additional parts are started through the plant to supply the shortages. By following this plan the shortages are promptly taken care of without waiting until the job is completed before they are discovered, and production is started on the required additional parts while the machines are still set up for this particular job.

For storing standard screw machine products in packages, there are 48 sections of steel bins, two sections being placed back to back with ample aisle space between the fronts. There are 72 bins in each section, making 3456 bins in all. These bins are 6-tiers high. The first three rows from the floor are 28 in. deep, 18 in. high and 24 in. wide, and the three upper tiers are about the same size, but not quite as deep. Bulk stock is stored in the shipping and packing department adjoining the stock bins, the larger stocks being kept in floor bins. One of these bins contains 3,000,000 nuts in one size.

The polishing department occupies an enclosed room adjoining the nut department and convenient to the clearing house and finished stock departments. Along one side are 31 standard double wheel polishing jacks, and on the opposite side the same number of a special type of flat wheel polishing machine for polishing cap screws. These machines have 28 x 3-in. wood wheels with an iron band around the outside, and leather on top. A fresh emery surface is rolled on the leather every night. The wheel is direct-driven by a 5-hp.



The Parts After Being Hardened Are Dumped into a Riddle, the Compound Passing Through the Screen and the Parts into a Quenching Tank from Which They Are Raised by a Bucket Elevator Shown at the Right

This Shows One of the Exhaust Pipes Used for Ventilation. Foul air is drawn through a wire screen just above the floor, and mechanically exhausted from the building

motor located at the top of the machine. In operation the end of the cap screw is slipped in an iron tube, in which it fits rather snugly, and the operator using the tube as a handle allows the work to rest against a bumper located close to the wheel. These machines have proven very effective from a production standpoint. Approximately 125,000 cap and set screw heads are polished every day.

Each row of polishing machines is connected to a fan exhaust system driven by a 50 hp. motor, the dust from the two units being discharged into one dust collector outside of the building.

The case hardening department is equipped with a battery of eight Frankfort furnaces that are used largely for case hardening nuts, reheating furnaces and cyanide pots. The furnaces are oil fired, but are arranged for the use of gas, should this be available. An interesting feature of this department is the arrangement of the case hardening furnaces for carrying away the heat and fumes from the furnaces. A hood is located over the front of each furnace, and this connects to a 36-in. exhaust pipe that extends straight up above the roof and connects with a ventilator. Hanging down 40 in. from the bottom of the hood in front of the furnaces and 12 in. away from the furnace doors are small chains, placed close together, providing a screen that shuts in the front of the furnace, this screen being sufficient to keep nearly all the heat and fumes from passing beyond it, so that instead of going into the room, the hot air rises straight up through the exhaust pipe and passes out of the building through the ventilator. The ventilating equipment was installed by the Ohio Blower Co.

Boxes of nuts and other product that are case hardened are dumped on a riddle and the compound passes through the screen, the parts being raked down an incline into a water quenching tank. They are carried from the quenching tank by a bucket conveyor. The water in the quenching tank is kept cool by being pumped up through a system of pipes located under the

A Foreman's Desk, and at the Right One of the Sheet Metal Stands That Take the Place of Lockers

The Neat and Convenient Arrangement of the Washrooms, Above Which Are the Toilet Rooms, Is Illustrated in This Typical Picture

roof, which are constantly being sprayed with cold water. A total product of 20,000 lb. goes through the hardening department every 24 hr. and 250,000 nuts are hardened per day.

The tool room is equipped for making all the gages, taps, fixtures, machine parts and special tools used in the plant, and is provided with adequate sheet metal storage bins for the products of this department. A well-equipped chemical laboratory adjoins the tool room.

In the operation of the plant 20,000 gal. of cutting and lubricating oil are used per week, of which 90 per cent is reclaimed. A basement room, 30 ft. by 50 ft., is provided in the center of the plant and in this are located a series of reclaiming tanks, oil pumps and soluble oil tanks. Oil storage tanks are located under the factory floor on each side of the basement room. Oil recovered in a separator passes into an overflow tank at each side of the separator, and from the overflow through three small settling tanks, each holding about 35 gal. The settlings are drawn from the bottom of these tanks every morning and thrown away. From the first series of settling tanks the oil passes into one or the other of two 800-gal. tanks, approximately 6 ft. high and 4 ft. in diameter, and from these two tanks to two other tanks of the same size. A Bowser pump is used for drawing the settlings from the larger tanks, which is done every alternate day. These settlings go into other tanks for further reclaiming.

Under gravity pressure the good oil passes from the last reclaiming tank to the storage tanks for reclaimed oil, under the floor. There are five of these storage tanks, with capacities ranging from 3150 to 6000 gal. The reclaimed oil is pumped to a central station or into a tank car holding 100 gal., in which it is hauled to the machines. Seven of the oiling stations are provided, but only one is now being used because of trouble due to workmen sometimes taking the wrong mixture.

The new oil tanks are located on the side of the basement settling room, opposite the reclaimed oil tanks. The new oil tanks include an 8000 and 13,000-gal. tank for engine oil, a 12,000-gal. tank for lard oil, a 12,000-gal. tank for paraffine and a 13,000-gal. tank for compounded oil. New oil is piped from tank cars in a 4-in. line and is pumped from these tanks in whatever mixture is desired into tank cars. The soluble oil, which is stored in small tanks in the basement, is used as a cutting compound on a great deal of the secondary operation work.

The fan heating and ventilating system consists of four complete units located in different sections of the plant. Each unit includes a main supply fan with a capacity of 100,000 cu. ft. per min., an exhaust fan with a capacity of 70,000 cu. ft. per min., and an air washer with a capacity of 90,000 cu. ft. per min. The heaters are composed of Vento cast-iron radiators, each heater having 7296 sq. ft. of radiation placed two tiers high.

Air passes through the washer, being cleansed by a spray of water, and then through the heating coils and on into the ducts. The returns from the heaters are taken to a vacuum pump near the unit and discharged to the feed water heater in the boiler room. Each supply and exhaust fan is driven by a steam engine from one shaft. The supply fan is driven from this shaft by a silent chain drive, the exhaust fan by a belt, which may be removed, and an exhaust fan by a motor. The latter drive is provided for use in case it is desired to operate only the exhaust fan. However, both fans are kept in operation in the summer, the supply fan bringing in fresh air from outside to supplement the ventilation afforded by the windows. The inlets and outlets are provided with a damper so that all the air going through the warm air supply system may be taken from outside; all air in the exhaust system may be discharged outside or the exhaust air may be mixed with the fresh air in any proportion desired. As the plant is operated, a mixture of the outside and inside air is used in the winter, resulting in a saving of fuel that would be required for heating air taken entirely from the outside during the extremely cold weather.

The warm air supply is carried from each heating unit to main ducts, 8 ft. 6 in. by 48 in., at the fan discharge and tapering down to 5 ft. 4 in. Channels are provided in the saw-tooth construction so that there is sufficient space for carrying the ducts above the lower cord of the roof truss. Branches lead from the main duct in alternate saw-tooth bays, and from the branches are horizontal discharge outlets. Each main duct has eight branches and 20 discharge outlets. Each of these has dampers for regulating the velocity of the air. The air discharge at each outlet is 1400 cu. ft. per min.

The exhaust for each unit is taken from the floor through a specially designed wire screen and pipe frame, which extends down to the floor at alternate columns. There are four of these exhausts to each unit, 58 in. square at the floor. The velocity of the air through this screen is 200 cu. ft. per min. The main exhaust duct is 8 ft. 6 in. by 3 ft. at the fan. This main duct is also provided with deflecting dampers and valve dampers. With the use of this system a complete change of air can be made in the plant in 18 min. The warm air heating system is supplemented by a low pressure vacuum system that supplies radiators located

around the sides of the building and also furnishes heat for the offices.

The fans and heaters were supplied by the Buffalo Forge Co., the engine for driving the fans by the Ball Engine Co., and the vacuum pumps for taking the condensation from the heaters by the National Steam Pump Co. The Carrier air washing system is used. In the installation of the heating and ventilating ducts 235,000 lb. of galvanized iron sheets were used.

Steam for heating and for operating pumps and other service is supplied by three 400-hp. Sterling water tube boilers equipped with Riley under-feed stokers. A tunnel 425 ft. long connects the boiler house with the plant. In the tunnel are the steam, hot water and ice water circulating lines and electrical conduits.

The electrical power is supplied by a commercial circuit. A transformer vault is located in the raw stock room, and opposite that is a main switchboard with a capacity of 5500 amperes. This has 21 600-ampere oil circut breakers. The power current is 440 volt, 2 phase, 4 wire, 60 cycle. This is distributed to 81 power distribution panels located through the plant. From these panels branch circuits go to the individual machines.

The plant is lighted by 200 watt lamps spaced on 20 ft. centers, 11 ft. above the floor and having 18-in. Adams Bagnall Electrical Co. reflectors. Each light is individually controlled by a cord connected to a ceiling switch. General lighting is used throughout, with the exception of a few individual drop lamps for work in the tool room. Each column has a light plug which is provided for use in case extra lighting is needed in repairing machines.

In arranging the plant a great deal of attention was given to the problem of feeding the large number of employees, and the method worked out has proved very satisfactory. On the north side of the main building, near the offices, is a cafeteria with a seating capacity of 350. This is for the women employees and office force, the former getting their lunches at 11.30 and the latter following at noon. In addition, five complete serving units are provided for the shop men in the outside aisles and other parts of the plant, having a capacity for feeding 850 men during the noon hour. The woman who has charge of each auxiliary serving unit secures her supply of food from the kitchen adjoining the main dining room and has everything ready to serve when the men quit work at the noon hour. Each unit has its own equipment for making coffee, and for keeping the food warm. Wooden tables and benches are provided for the men. These are kept stacked up in compact form when not in use, two workmen placing them out on the floor near the serving unit a few minutes before lunch time. Workmen, as well as women employees, who eat in the main cafeteria, may buy their entire lunch or may supplement what they have brought from home with coffee or anything else they wish to buy at the cafeterias. All food furnished at the main cafeteria may be had at the smaller serving units.

In place of lockers, portable sheet metal stands are located in the outer aisles and at other convenient points. These are 12 ft. long, with rows of coat hooks on each side and a shelf above for lunch boxes. A cover extends over the top of these stands, affording protection from dust for tne clothing and lunch boxes.

In the main building, located at convenient points, are six wash rooms and toilet rooms, four for men and two for women. These are two stories, 30 ft. long and 20 ft. wide, the wash rooms being on the floor level and the toilet rooms on the second floor. The wash rooms are not enclosed, making them convenient for access from the different sides. Each wash room is equipped with 12 white-enameled wash basins, 6 ft. long, arranged in three rows, water being supplied through sprayers. At the side of the room a hot and cold water mixer is provided for each row of basins, and shortly before the men quit work the spray of water, at the proper temperature is turned into the basins. Stairs lead to the toilet room, above the wash room, each of which in the men's department is equipped with 10 toilets and five urinals with high-grade fixtures. Fan ventilation is provided in each toilet room. Additional wash and toilet rooms are in the stock and tool room.

Hot water is supplied for lavatory purposes in both the factory and office buildings through lines connected to a circulating pump in the boiler house. Cold water for drinking is supplied by a Phœnix ice machine.

A school for women employees is conducted in the plant, instruction in English and hygiene being given twice a week to a class of about twenty. Of the 1500 employees, 350 are women, representing 29 nationalities. Various sports are also provided for the women employees, including base ball, volley ball, tennis, etc. A well-equipped hospital is maintained with a nurse in charge and a physician in attendance during certain hours.

The executive office building is located at the front of the main building, to which it is connected by a passage way. The office building is a two-story and basement, reinforced concrete structure, 112 x 50 ft.

The plant was designed by George S. Rider & Co., industrial engineers, Cleveland, who also had charge of its erection.

One of the Five Serving Units Provided in Aisles for the Men, Food Being Prepared in the Kitchen Adjoining the Main Cafeteria. In the insert is shown the women employees being taught English and hygiene

Disposing of Government Machinery

National Supply and Machinery Dealers' Association, in Session in New York, Considers Problems Growing Out of the War and Other Subjects

THE National Supply and Machinery Dealers' Association, held its fall meeting at the Hotel Astor, New York, Oct. 15. The officers of the association, which numbers 240 dealers, are: J. D. Nicklis, Manning, Maxwell & Moore, Inc., New York, president; George H. Cherrington, Brown & Zortman Machinery Co., Pittsburgh, first vice-president; Crannel Morgan, the Hardware & Supply Co., Akron, Ohio, second vice-president; Thomas A. Fernley, secretary-treasurer; and T. James Fernley, advisory secretary. The membership represents 30 States, the District of Columbia and Canada.

The meeting was opened by Vice-President Cherrington, who delivered a few remarks on the progress of the association and the increased membership. The speaker of the morning session was Lieut. Col. A. La Mar, assistant director of sales in the War Department, who read a paper on "The Disposal of Government Owned Surplus of New and Second Hand Machine Tools." Lieut. Col. La Mar requested discussion of the possibilities of co-operation in these sales between the machine tool dealers and the Government. The discussion brought out the point that the National Supply and Machinery Dealers' Association in May of this year submitted to the office of the Director of Sales, Washington, a proposal that all machinery sales should be handled through dealers in various machinery districts of the United States on a commission basis. Although numerous meetings were held between representatives of the War Department and the association, the proposal was either rejected or never acted upon, as a conclusive reply was never received. Lieut. Col. La Mar explained that the proposal had never come to his notice. The proposal suggested the appointment of one large machine tool dealer in each district with all other dealers interested in handling the sales of Government machine tools as sub-agents. This arrangement would necessitate the Government dealing with only about 25 or 30 companies, who would be responsible for the sub-agents. The proposal provided for a 12½ per cent commission on all sales, the sub-agent receiving 10 per cent and the Government appointed dealer 2½ per cent.

The Rate of Commission

Lieut.-Col. La Mar raised an objection to the rate of commission, suggesting that 10 per cent was a rather high percentage for the sale of second-hand machinery, but it was pointed out by several speakers that the rate was necessary, not only to cover the expenses of placing one of the best salesmen in the organization in exclusive charge of the used machinery department, but to influence salesmen to push the second-hand machine with the same interest as the new machine. Another suggestion brought up by Lieut. Col. La Mar was that dealers, should they be appointed, carry types of used machines in stock. After a short discussion, he conceded that this might be impossible. The chief question that arose was whether dealers should handle all machinery or only the machine tool lines of companies they represent. A vote was taken and the result was a majority in favor of selling only those lines represented.

Questioned as to the amount of machinery still to be sold, Lieut. Col. La Mar estimated it to total about $35,000,000. In order to show what priced machine tools were represented, he read the inventory of three of the largest plants. In the first were 395 machines valued at about $375,415; in the second 586 machines valued at about $975,700; and in the third 30 machines valued at about $108,646. This set a range of prices on machines of $950 to $3,600 each.

Negotiations with the Government

As the consensus of opinion was that negotiations should be reopened with the Government on the question of dealers handling the sales of machinery, in order to expedite the disposal of the large stock, Anton Vonnegut of the Vonnegut Machine Co., Indianapolis, moved that a committee be appointed to draft a new proposal to the Director of Sales and that the committee should be empowered to close an agreement. The motion was passed unanimously and Lieut. Col. La Mar expressed the hope that the Government and machine tool dealers would find a satisfactory method of co-operating.

At the afternoon session of the meeting a short explanation was given of the methods used by the Government in determining the percentage of servicability in machines placed on sale. In co-operation with several universities and technical organizations, the Government investigated various types of machine tools that have been in use over long periods and estimated the number of years of service in a tool. As a record of time worked was kept of practically all machines placed on sale by the Government, after any defects had been taken into consideration, the number of months or years the machine had been operated and the number of hours per day were subtracted from the whole estimated time of service and the percentage of remaining service found. Prices were established on the present value of the machine, less 10 per cent in the case of a new tool, untouched. These percentages of serviceability range from 90 per cent for the new machine to 8 per cent in the case of a machine to be sold for the value of the metal only.

During an informal discussion of methods to be employed in dividing commissions on sales made outside of a dealer's regular territory, the opinion was generally expressed that all disagreements on such questions should be settled without bringing them to the attention of the manufacturer, as has been the case many times in the past. The question of a standard type of contract between dealer and manufacturer was brought before the meeting, but received small encouragement, most of the members favoring the oral agreement, rather than iron clad contract that might serve many times to tie their hands.

Increasing Commissions

The speaker of the afternoon session was C. O. Dowding, Patterson, Gottfried & Hunter, Inc., New York, who read a paper advocating increased commissions to dealers in the sale of machine tools. In connection with the paper, which strongly advised action in the matter, the secretary read letters from a new local organization of machinery dealers, "The Machine Tool Dealers' Association," comprising dealers in New York. The letter suggested action in the matter of increased commissions by the national association by communication with the National Machine Tool Builders' Association. In a heated discussion that followed the reading of the paper and the letter, such action was declared to be beyond the scope of the association and would probably be misconstrued by the manufacturers.

In referring to the proposition to attempt negotiations on the subject, H. F. Allen, manager machine tool division Fairbanks Co., New York, explained that while an increased commission might be justified by increased overhead expenses in some instances, an increase could not be fairly requested for all tools. He further pointed out that many manufacturers have in the past few years shown a tendency to eliminate the dealer and sell direct, and that action of the kind suggested, particularly at this time, when manufacturers are facing increased overhead and labor trouble, would not be conducive to good relations between dealer and manufacturer. This opinion was concurred in by a majority of the members and the proposition was withdrawn, although the justice

of such an increase some time in the future was brought out in the discussion.

The final discussion of the session was as to the advisability of featuring agents' name in trade papers and circular advertising of machinery. It was agreed that the publication of the names of agents by the manufacturer would be to the benefit of all concerned, and while no action was taken toward bringing this to the manufacturers' attention it was suggested that members sufficiently interested should write to the companies they represent, urging this use of their name in advertising.

Britain's Experimental Foundry

A short description of the foundry built during the war by the British Government at Brentford, and the reasons which prompted the British ministry of munitions in establishing it, were presented at the Annual Convention of the American Foundrymen's Association, Philadelphia, by G. Ernest Wells, of Edgar Allen & Co., Sheffield, England. During the war Mr. Wells was controller of castings for the British ministry of munitions. "Primarily," he said, "the purpose was to enable researches to be made into all questions affecting the manufacture of malleable iron castings. In Great Britain the output of most firms is small and the result is that with one or two exceptions, practically no producer does sufficient business to enable it to conduct the manufacture of malleable iron castings on thorough and up-to-date scientific lines.

"Before the war, makers of pig iron specialized in irons suitable for use in the manufacture of malleable iron castings, and each maker used a brand or trademark by which his iron was known. The malleable iron founder made tests of the different brands and eventually bought those particular ones which in his opinion best suited his methods.

"After the outbreak of the war, many of our supplies of raw material were either cut off or sidetracked for different purposes with the result that although malleable iron founders still continued to buy the brands of iron which had given them satisfaction in the past, they found all sorts of new troubles cropping up for no apparent reason. Had all the founders been in possession of up-to-date chemical laboratories before the war, they would naturally have quickly discovered that the analysis of their material had completely changed and would have acted accordingly, but in view of the lack of facilities for carrying out this work, it was felt by the ministry of munitions that the best thing to do was to equip a small foundry with trained technical staff, in order that the difficulties experienced should be submitted to impartial and independent investigation.

"The plant erected contained an up-to-date cupola, a number of pot-holes, one or two different types of annealing furnaces, and a completely equipped physical and mechanical testing laboratory. This laboratory was put in charge of Mr. Mason, a skilled research chemist who had specialized in malleable iron problems, while the foundry itself was in charge of a malleable iron founder of considerable experience.

"As the work developed, difficulties of all sorts experienced by manufacturers were put up to the government's experimental foundry for solution, and after a thorough investigation a report was made which was at the disposal of any founder who wished to see it.

"In this way a great deal of valuable work was done, and in certain cases raw materials were successfully used which hitherto had been considered valueless for the manufacture of malleable iron castings. At a later date, a good deal of help was given to firms who were experiencing difficulty in the manufacture of so-called semi-steel shell, and John Shaw arranged demonstrations at the Brentford foundry so that contractors were able to send their technical men to see exactly how success was to be attained."

Westinghouse Scholarships

The awards of the four annual war memorial scholarships of $500 each, established by the Westinghouse Electric & Mfg. Co., East Pittsburgh, have been announced. These awards, made by competitive examinations, were allotted as follows: Herbert S. Pahren, order clerk in the Cincinnati office, who has selected for his scholarship a technical engineering course at the University of Wisconsin; Arthur Marthens, cost department, East Pittsburgh, who has chosen a course in electrical engineering at the Carnegie Institute of Technology, Pittsburgh; Paul O. Langguth, draftsman in the engineering department, East Pittsburgh, who will take an electrical engineering course at the University of Pittsburgh; Andrew P. Lesniak, production department, East Pittsburgh, who has selected a mechanical engineering course at the University of Pittsburgh.

Commercial Analysis of Ferrosilicon

A complete analysis of ferrosilicon involves the determination of many elements in audition to iron and silicon, viz., carbon, manganese, phosphorus, sulphur, calcium, magnesium, barium and aluminum, and as direct determinations are difficult and laborious, some elements comprising silicon itself are sometimes estimated by difference. In bringing the subject before the American Electrochemical Society at one of its recent general meetings, Earl M. Anger, New York, insisted upon the necessity of very careful sampling of the ferrosilicon. In high-grade alloys the segregation of the silicon from the iron silicide is very pronounced, the silicon going to the top when the cast is cooling. For the determination of the silicon itself, Mr. Anger disintegrates the alloy with sodium carbonate; in alloys of more than 25 per cent. of silicon, this would attack the platinum crucible so the carbonate is replaced by sodium peroxide rather than by sodium hydroxide, in iron (not in nickel) crucibles. These recommendations were questioned by H. R. Power of the Carborundum Co., who prefers nickel crucibles and the peroxide.

Biakametal, an Alloy of Zinc and Copper

An alloy of zinc and copper, the composition of which, it is stated, metallurgists have made every effort to determine without success, has made its appearance in Italy, where it has quickly demonstrated its usefulness. It is called Biakametal and United States Trade Commissioner H. C. MacLean, at Rome, has sent a report on it to the Department of Commerce at Washington. A new company having a capital of $2,316,000 has been formed to carry on its manufacture. It is stronger than steel and less corrosive than copper according to the report. It is said to have a high limit of elasticity and high resistance to thermic and to chemical action. It can be cast, turned, drawn, forged, rolled and stamped and has proved useful in aeronautic and marine construction on account of its relatively light weight and unusual strength and anti-corrosive qualities.

National Acme Co. to Film Processes

The National Acme Co., Cleveland, manufacturer of automatic screw machines and products, is arranging for the filming of the processes in its plants, from the receiving of the order, through the manufacturing operations, to the delivery of its goods. The projectors will be of small size, fitting into a receptacle the size of a suit case and each branch sales office will be equipped with a projector and set of films. Connection may be made in an ordinary electric light socket and a white sheet of paper, wall, or convenient blank space used as a screen. Pictures will be shown to prospective purchasers of the company's products and all others interested. The filming is being carried on by the industrial department of the Universal Film Co. It is estimated that an exhibition will occupy about an hour and a half.

American Gear Manufacturers' Association

Standardization and the Labor Problem Prominent Among the Topics of the Semi-Annual Meeting at Boston

AT the third semi-annual convention of the American Gear Manufacturers' Association held at the Copley-Plaza Hotel, Boston, Mass., Oct. 13, 14, 15 and 16, it developed that the various committees appointed at the Syracuse convention in 1918 to work out a standardization plan for manufacturing practices made considerable headway along constructive lines during the past year. The census of opinion among those attending the convention was that it was in every respect the most satisfactory session ever before held. Much praise was bestowed on the local entertainment committee, who saw to it that sufficient relaxation was given the members of the association to make the work of the four-day session highly agreeable. One feature stood out conspicuously throughout the meeting and that was the eagerness to discuss thoroughly the many problems submitted, each session being largely attended. The on-their-toes sentiment was evident up to the time that President Sinram declared the convention closed.

Invitations were extended the members to visit gear works located at Wollaston, Worcester and Springfield, Mass., and at Providence, R. I., as well as the General Electric plant at Lynn, Mass., but so much important matter was booked for presentation the members of the association in most cases felt they could not avail themselves the opportunity to visit the shops mentioned. The publicity committee came in for its share of attention and praise, the successful efforts in interesting the Boston press in the doings of the convention being especially gratifying.

Although standardization was the keynote of the convention, the labor problem because of the proximity of the steel strike, was widely discussed and considerable time and thought were given the question of manufacturing costs and efficiency of salesmanship as well.

Detroit, Mich., was the place selected to hold the annual meeting, and April 29 and 30 and May 1, the dates.

President Sinram's Address

The convention opened Monday morning promptly on schedule with President F. W. Sinram, Van Dorn & Dutton Co., Cleveland, in the chair. His remarks were confined largely to observations and suggestions which were well received. He said in part: "May I suggest that a spirit of give and take must characterize your deliberations, criticisms and conclusions,—all to the end that we may all work to something definite and specific in the interest of all, and that a gear standard to be a recognized standard shall be an A. G. M. A. standard. Let your consideration of the initial recommendations encourage greater activity and further progress. Permit me to remind you again that the success of the A. G. M. A. is the responsibility of every representative."

Frank Burgess, Boston Gear Works, Wollaston, Mass., chairman of the local entertainment committee then welcomed those present in behalf of the Boston members of the association. Hon. Andrew J. Peters, mayor of Boston, being out of town, President Walter Collins, Common Council, extended the greetings of the city and praised the gear manufacturers "for the conspicuous position they held in our industrial life and in the bringing to a successful conclusion the great war."

The rest of the morning was devoted to the reading and approval of the various official reports. The membership committee's report showed a strong healthy growth of the association during the past year, the increase in membership during that period rising from 92 to 130. The report also showed 69 concerns located in the four quarters of the country as members of the association, whereas a year ago there were but 46 concerns enrolled.

During the convention the membership was increased by 12, applications being approved as follows: M. F. Simmons, General Electric Co., Schenectady, N. Y.; A. A. Alles, jr., and Eliot A. Kebler, Fawcus Machine Co., Pittsburgh; Robert Cromwell and George A. Proctor, Grant Gear Works, Boston; C. A. Arnold, Warren Machine Products Co., Warren, Pa.; Walter S. Giele, Lebanon Gear & Machine Works, Lebanon, Pa.; S. L. Nicholsen, Westinghouse Electric & Mfg. Co., East Pittsburgh; David D. Sternbergh, American Die & Tool Co., Reading, Pa.; F. O. Hoagland, Bilton Machine Tool Co., Bridgeport, Conn.; Oscar X. Buehler, Indianapolis Tool Mfg. Co., Indianapolis; Glenn Muffly, G. Bradum Co., Cleveland.

Uniform Cost Accounting

The question of uniform cost accounting attracted much attention. At various periods of the convention it was demonstrated beyond question of a doubt that the gear business is keenly suffering for the lack of uniform cost accounting. In one instance it was pointed out that bids submitted by various manufacturers on a small number of gears ranged all the way from $7.50 to better than $21 each. Such a wide discrepancy proved the need of all gear makers having a uniform scheme of accounting so that competitive bids can be brought within a narrower range and financial losses eliminated.

A. A. Alles, jr., Fawcus Machine Co., Pittsburgh, gave an interesting talk on the subject of uniform cost accounting Monday afternoon. He said in part: "One of the most alarming conditions that manufacturers in all lines of industry have had to face is reckless competition. There is a dead-line beyond which no manufacturer can go in making prices. If he knows the dead-line he is safe. If not, through fear of the loss of sales he will guess at it, only to get the business and suffer a loss of capital in its production. For him to continue to lose spells disaster. To define the dead-line is one of the objects of a cost system. No manufacturer would think of operating his business without one. Some of those in use are accurate, and others are not so accurate. This was made plain a few years ago by the Federal Trade Commission's investigation of some 250,000 business concerns, which revealed that only 5 per cent knew their manufacturing costs."

H. Fleckenstein, Hendley Gear Co., started the second day of the convention with an interesting address on Hindley worm gears, and by it won for himself a membership in the committee on worm and spiral gear standardization. He pointed out that worm gearing is one of the oldest mechanical movements, dating back to the fifteenth century. He then brought the subject up to its standard today in a thoroughly masterly way, which proved beyond question he is one of the leading authorities on worm gearing in this country.

The Labor Problem

Dr. E. J. Cattell, city statistician, Philadelphia, who was in town to address the New England Purchasing Agents Association, accepted the invitation of President Sinram to address the gear makers. He told of his study of labor conditions during the past 42 years and assured those present that we are over the peak of our present labor troubles, and on the road to better times. He pointed out with several examples that out of every great labor upheaval we have grown a stronger nation. Labor unions may be all right, but the one thing Dr. Cattell believes should exist is a union giving the right of labor to labor. He said in part:

"The high cost of loafing is our real trouble. We must get men doing work. We have come out of this war with a better distribution of wealth than in any other country. At least 22,000,000 people in America

have money invested in the Government. There is only 3 per cent of labor that is poisonous. Ninety-seven per cent is true American. These loyal working men are going to have higher wages, but they are going to be paid for specific work. Labor lost its head a while ago, but lessons have got to be learned through a blow. I can say now that labor conditions are 100 per cent better in Philadelphia at the present time than they were six months ago."

Later in the day, following luncheon, the members were addressed by Roger W. Babson, Wellesley Hills, Mass., on "The Labor Problem." The gear manufacturers are fortunate, he said, in having been able to maintain the open shop, which is the final form that industry will take. The closed shop has the same relation to the industry, he said, as the measles and chickenpox have to the family. It has to come. The open and closed shop is simply a phase. It is a question which will produce the most gears, and the industry knows that the open shop will produce the most. That is the reason why employees should give it more thought. The manufacturers who are sweating with labor troubles to-day will be free and easy five years from now, and those who have no troubles now will have them then.

The real difficulty is not wages and hours, but the old problem of master and man. The master to-day is struggling to maintain his position as master and his self respect. The wage worker is fighting to maintain his self respect. Hence it is a conflict of emotions. The labor problem is not a problem as such, but a process, a movement.

Mr. Babson said many other things in regard to the present labor problem that did not meet the sanction of those present. This disagreement was strongly voiced the following day by several members of the association, who took occasion to question Mr. Babson after his address as to his qualifications to speak as he did.

J. B. Foote, Foote Brothers Gear & Machine Co., Chicago, as chairman of the labor committee, said he could not agree with Mr. Babson on the labor problem. "There is nothing mental or emotional about it," he said. "It is a hard job. Our labor question is the most dominating for us to consider. We cannot stop labor unions from organizing and the only thing for the manufacturers to do is to organize themselves as strongly as possible. We must fight the unions or go out of business. Babson admitted that the open shop is right. We know it is right. The demands of the labor unions are autocratic. There is no give and take to it. As to wages I think every one of us should pay what prevailing wages are and not quibble over five cents an hour."

The principles of business success were discussed by S. L. Nicholson, Westinghouse Electric & Mfg. Co., in an address which was one of the high spots of the convention. His talk was on system and organization and commercial activities.

Running over the general history of business, Mr. Nicholson showed that in many instances business grew up around a man who was good in the shop and went out to do business for himself. He knew all about the manufacturing end of it, and he had some customers among friends to start with and the business grew by accretion. But to-day, with up-to-date commercial methods, a new concern can make success and get ahead of the old concern. A commercial department is needed, he said, to keep the shop uniformly filled and occupied with orders. You may think that you are developing business when you are only filling the demand. If the demand is so heavy that you can only meet it, then somebody is going to slip into the field and take the new business away from you.

"Do you know that it costs $8.50 for each quotation you make? Until you realize this you don't see the leak in your business. You want to analyze the ratio between quotations and the business secured, how much business was lost and how much was abandoned." Mr. Nicholson said he had found that the amount of business abandoned by the salesmen was three times as much as the busines secured and business lost.

"Price is not a good reason for losing business. If you are in business you believe you can give as much for a dollar as your competitor. Hence it comes down to salesmanship. In many instances you will find that when a salesman reports a loss of business on account of price you will find that the competitor did not quote on the same goods and that your salesman should have known it.

"All quotations should be confirmed in writing and numbers assigned to them. Put the quotations in a folder and mark it with the name of the prospective customer. Then follow it by a personal call by a salesman, or by mail, till you have secured the business, lost it or abandoned it. The salesman's duty is to load your shop so that your tools are not idle. If you discover that certain machines are going to be idle, by running over your quotation files you can concentrate the efforts of your salesmen on the kind of business that will keep the machines running."

Work of the Committees

The standardization plan involved is a task that can only be solved after an exhaustive study of the many perplexing questions connected with the manufacture of the various kinds of gears, not only by the members of sub-committees appointed to formulate the standards, but by the co-operation of each individual member of the association. This fact was frequently brought out at the meetings, some of the committees reporting almost unsurmountable difficulties being met through the members not answering questionnaires placed in their hands previous to the convention.

President Sinram, Secretary Hamlin and B. F. Waterman, Browne & Sharpe Mfg. Co., Providence, R. I., chairman of the general standardization committee, brought home to the ninety members present the absolute necessity of wholehearted co-operation.

Care necessarily must be taken to have the standards so constructed that they shall meet general requirements as well as those, say, of the manufacturers and consumers of electric railway and other equipment. For that reason the main purpose of the convention was to perfect as far as possible such progress as was reported along various constructive lines. The work of the committee on composition gearing, which involved research work covering a period of ten years, was especially gratifying to the members of the association, who adopted the report as a recommended standard.

Probably the most debated subject was the report on bevel gears, possibly because of the fact that the question of standardization in this particular line was of paramount interest to a majority of the members present. The recommended practice finally was referred back to the committee for further details.

The sprocket committee furnished an exhaustive blueprint booklet covering a mass of detail workouts, which met the approval of the convention. It was voted that the secretary be instructed to have the report printed in full and submitted to the members in time for their consideration at the annual meeting, and that copies be forwarded to the chain manufacturers.

The chairman of the herringbone committee reported that a set of gear standards were first submitted that failed to meet the requirements, and that a new set had been substituted, which were not in proper shape or form to present to members of the association. He assured Mr. Waterman and the members that the report would be presented in full at the next meeting.

No action on full reports were taken on the question of standardization of worm and spiral gears, hardening and heat treating and spur gears, but recommended practices of some of the sub-committees on standards for various phases of the process of gear manufacturing were approved as such, so that the work of the various committees as a whole proved constructive in many ways.

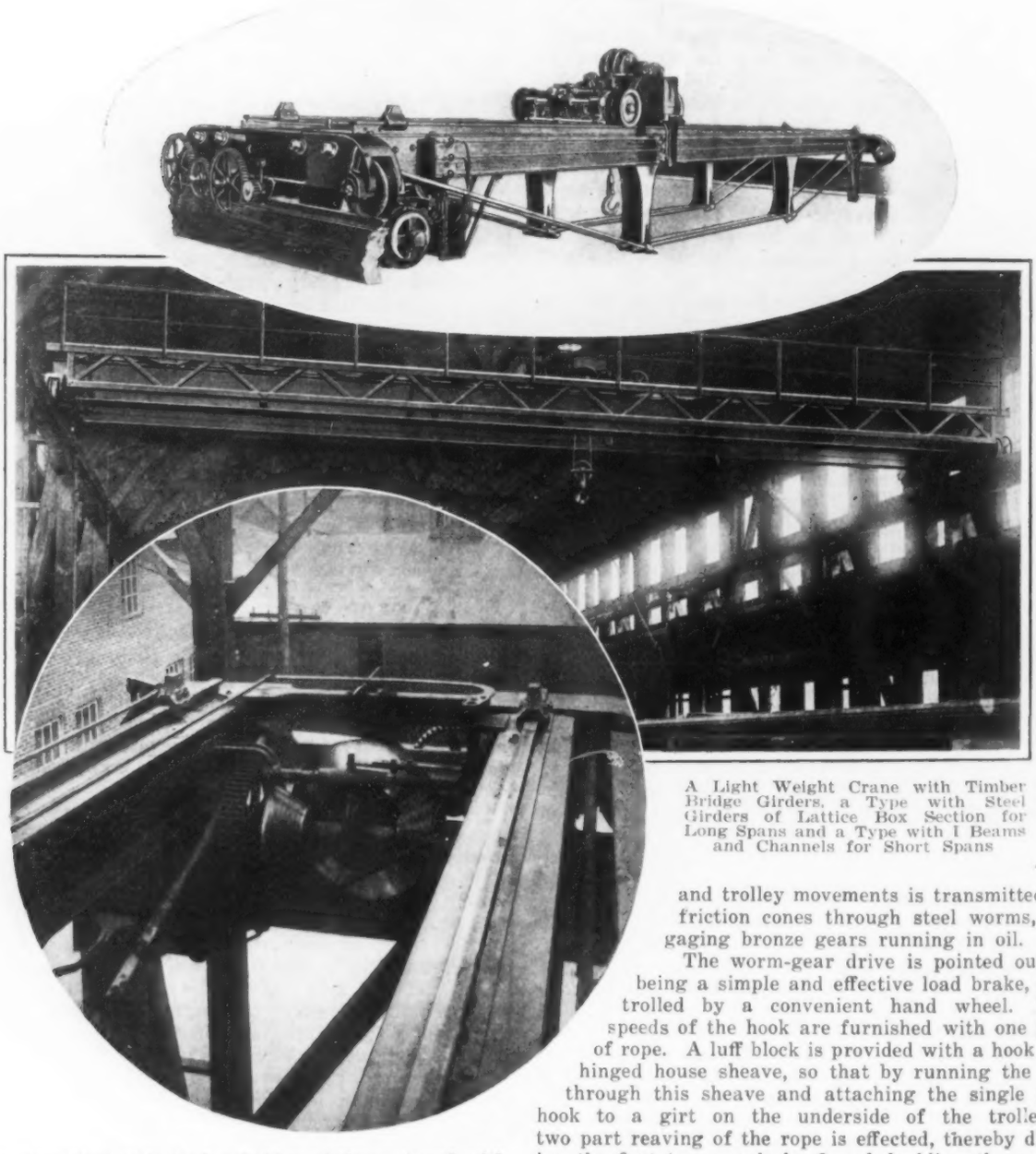
In addition a proposal form with certain modifications was approved, which should be ready for final vote at the annual meeting next year. At the conclusion of the reading of the various reports President Sinram complimented the committees for their work during the past year and urged that greater effort be made along the lines already submitted.

Traveling Cranes Announced by Old Manufacturing Company

Traveling cranes of three different types of construction are being manufactured by the Lane Mfg. Co., Montpelier, Vt. This company was established about 70 years ago and built its first overhead traveling crane about 40 years ago. Until this year, however, all efforts of this company have been confined principally to the stone working field. Originally Lane cranes were furnished with timber bridge girders, stayed with steel truss rods fastened to cast-iron bridge trucks and having a safety factor of about 7. This construction is explained as having the advantage of being exceptionally light for a given capacity. In addition to this type of crane two others are now being made, one with steel girders of the lattice box section type for long spans, and for short spans a type with rolled steel I beams reinforced with inverted channels riveted to the top flanges when necessary. The bridges, it is stated, are designed with a factor of safety of at least 5, and with sufficient strength to sustain the load without undue deflection, either horizontally or vertically.

A characteristic of these cranes is the employment of two motors for the three movements. Both motors are of the constant speed, non-reversing type, which eliminates the use of controllers and complex wiring. Control of all movements, including that of direction by means of a series of friction cones, is mechanical. This design is emphasized as effecting a saving in electric power which is ordinarily lost in frequent and quick stops and reversals, and speeding up or slowing down of variable reversing motors.

The bridge girders are supported by cast-iron end trucks, provided with cast-iron double flange chilled wheels, which have steel axles running in renewable bearings. The trolley is made of cast iron and is reinforced with steel tension rods. The sides are joined together by several large steel shafts. Power for hoist and trolley movements is transmitted by friction cones through steel worms, engaging bronze gears running in oil.



A Light Weight Crane with Timber Bridge Girders, a Type with Steel Girders of Lattice Box Section for Long Spans and a Type with I Beams and Channels for Short Spans

The worm-gear drive is pointed out as being a simple and effective load brake, controlled by a convenient hand wheel. Two speeds of the hook are furnished with one part of rope. A luff block is provided with a hook and hinged house sheave, so that by running the line through this sheave and attaching the single rope hook to a girt on the underside of the trolley a two part reaving of the rope is effected, thereby dividing the first two speeds by 2 and doubling the power, supplying 4 hoist speeds.

The hoist motor, through the same power cones, operates the trolley motion on the bridge at approximately 100 ft. per min. The reverse is obtained in the same manner as with the hoist movement. All movements are controlled by hand wheels.

The bridge motor drives a friction disc by transmission through a pair of opposed cones, alternately contacting therewith. Control of the bridge travel movement in either direction is effected by shifting the cones by a lever connected to a rod running the full length of the bridge near the operator's left hand.

A feature emphasized is the control of all movements by the operator while seated on the trolley, where he has a clear view over the hook as well as of all other points below the crane.

The cranes are being marketed by N. B. Payne & Co., 25 Church Street, New York.

Industrial Engineers Discuss Labor Unrest

Publicity to Counteract Radical Agitation, Dealing with Workmen as Individuals, and the Square Deal Urged as Remedies

THE present day industrial unrest and the various problems growing out of the relations between employers and employees were the subjects of various papers and discussions at the fall convention of the Society of Industrial Engineers, held at the Hotel Statler, Cleveland, Oct. 29-31. There was a registration of about 1200 at the meeting.

The speakers urged proper propaganda to counteract the agitation of radicals, dealing with employees individually instead of in a body, giving employees the "square deal," and the elimination of distrust between labor and capital. It was declared that there is no panacea for labor problems, and that industrial democracy, collective bargaining and other forms of dealing with men will fail unless fairness and justice are back of them. The society took action in favor of adjudication of labor disputes by Governmental legal machinery, with full authority to enforce its decisions. This was contained in the following formal declaration adopted at the closing business session.

We, the Society of Industrial Engineers, assembled in national conference and representing this profession in the United States, after thorough analysis and discussion, believe that we are by training, experience, ability, and industrial relation, justified in making the following declaration in regard to the present industrial situation:

1. We declare industrial unrest will be done away with only when a national purpose backs a proper remedy.
2. We declare that the President's industrial conference just closed failed because it did not consider fundamentals and principles but discussed methods and mechanisms.
3. We declare that labor disputes must be made justifiable, and governmental legal machinery set up to adjudicate such disputes with full authority to enforce its decisions.
4. We regret no industrial engineers were appointed on the President's industrial conference just closed, and we earnestly request that industrial engineers be appointed on the President's second industrial conference about to be called together.

L. W. Wallace, president of the society, presented the first paper, taking for his subject "The Industrial Engineers' Opportunity Through Contact with Labor."

Frankness, Honesty and Justice Necessary Principles

"I do not anticipate that at this time or at any other further period," said the speaker, "there will be evolved a panacea that will forever solve any and all problems that may arise between employer and employee. This is no more possible than that a plan can be evolved whereby there will be no more wars between nations. Indeed, plans can be formulated and principles can be laid down which will greatly reduce the probability of labor disputes, and which will eliminate the likelihood of many wars. Some form of industrial democracy on the one hand, and a league of nations on the other, unquestionably will be an agent of great value and influence, but these agents within and of themselves will not eliminate labor troubles nor make impossible future wars.

"In recent weeks we have heard much about the efficacy of industrial democracy, of shop committees, of a Senate and House plan, of collective bargaining as panaceas for all labor problems. During the same period we have had striking examples of the inadequacy of all these plans. Industrial democracy is a misnomer unless fairly and honestly applied. Collective bargaining is a great danger if wrongly applied, and is used as an instrument of autocratic power. No, labor problems have always existed, and are likely to continue. There is no panacea, such as industrial democracy, profit-sharing, committee system, open shop, closed shop or collective bargaining. None of these agencies will accomplish or avail much unless there be behind them and disseminated through every fiber and thread, the spirit of frankness, honesty and justice. If these principles are present, there will be no labor trouble. If they be present, it does not matter much what plan is used. This accounts for many striking examples of the successful management of labor through each of the plans named."

The speaker contended that the problem before the American public is to evolve plans and inaugurate policies that will make the use of arbitrary and autocratic power a grave offense against the community. Such plans should provide punishment for the autocratic employer or the autocratic labor leader. Many of the abuses have grown up through ignorance of cause and effect. Ignorance of cause and effect on the part of labor leaders leads to faulty conclusions such as to the belief that to limit production is to benefit the worker, to decrease the length of the work day is conducive to the prosperity of society and labor, to oppose the training of the worker, to place all workers in a given trade at par regardless of capacity or ability, to demand compensation for which no adequate service has been rendered, and to deny the right of individual choice of employment.

An Opportunity for the Industrial Engineer

The speaker held that it is a function of the industrial engineer to see to it that every action is based upon the principle of honesty, fairness and justice to the employer or employee and the public, to so formulate the plan of action as to eliminate unfair privilege of employer and employee, and to organize a plant so as to make it difficult for an incompetent to hold a position of authority or to exert autocratic control. He said it is the industrial expert who must finally work out these problems. He must raise the standard of intelligence, loyalty and skill of the workman, and must overcome the scarcity of labor by increased efficiency of management, of production, transportation, etc. Idle machinery must not be tolerated. An 8 or 10-hr. production period per day in a plant is intolerable. It must be 24. To offset the war labor loss the industrial engineer must devise the means of using the large army of persons who are handicapped in some way or other.

In a paper on "College Training for Executives" James W. Roe, secretary of the Railway Car Manufacturers' Association, referred to a circular letter sent out by the Carnegie Foundation to members of the four large engineering societies asking them to express opinions as to the order of importance they would give to various qualities in judging the reasons for engineering success or in sizing up young men for employment or promotion. More than 7000 replies were received, and of these 94.5 per cent placed character first and a similar majority put knowledge and technique last. The rating of the groups in per cent according to an analysis of these replies was as follows: Character, 24; judgment, 19.5; efficiency, 16.5; understanding of men, 16; knowledge of fundamentals, 15; technique, 10.

Frank G. Gilbreth, Providence, R. I., in an address on "Unnecessary Fatigue—the Multi-Billion Enemy of America," said that the two things on which capital and labor can get together are safety first, and fatigue studies. He claimed that by the elimination of fatigue the value of the day's output of 25,000,000 American workers could be increased 20 cents each. The speaker illustrated his talk with lantern slides, showing pictures of chairs designed to make workers comfortable, and various motion picture studies showing lost motions of workers. During the meeting the board of directors appointed Mr. Gilbreth to co-operate with Dr. Roe, vice president of the society, and in charge of research to investigate the causes of fatigue, with the

idea of introducing fatigue-saving devices widely into industries.

Remedies for Industrial Evils

The present labor situation and industrial unrest were discussed at length during an open forum that lasted through one session. The topic assigned for the discussion was "Ways and Means of Meeting the Labor Situation in America." Dorr E. Felt, president Illinois Manufacturers' Association, presided at the meeting and the leaders in the discussion were W. A. Grieves, assistant secretary Jeffrey Mfg. Co., Columbus, Ohio, and D. G. Stanbrough, general superintendent Packard Motor Car Co., Detroit. Probably the most important contention made by Mr. Grieves in his paper was that workingmen should be dealt with individually rather than in a mass. He stated that men engaged in industry today owe an obligation to industry, and what affects the employer on the Pacific Coast affects one on the Atlantic Coast, and in fact, the effect spreads around the world.

The speaker contended that among things needed is less untruthful and more truthful publicity on industrial matters. The problems growing out of the relationship between employer and employee are never going to be handled satisfactorily by dealing with the men in a mass. The employer will have gone a long way when he recognizes that the individual should be dealt with. He believed in judicious publicity, but declared that our industrial problems are getting too much of the wrong kind of publicity. The agitators and the theorists are having a great deal to say, but after these are through, the hard-headed business men will step in and guide industry along the right course. He believed that 95 per cent of the people are sane. The wrong kind of publicity is being disseminated by yellow newspapers, moving pictures and agitators.

What is needed at this moment, according to the speaker, is proper publicity. The people are being misled by the fact that everybody is being denounced as a profiteer. Present conditions afford a fertile field for the fellows who make their living by sowing discord. The labor situation is one that is constantly changing. The whole question of dealing with labor resolves itself into one of individual treatment. If a manufacturer needs a large force of employees to make individual adjustments with customers, it is equally as profitable to handle grievances of employees individually. No company, he declared, is too large to deal with the individual and to adjust each man's grievance. Mass treatment or mass adjustment will never meet the situation. There can be no permanent plan of dealing with labor problems. The plan must be subject to continual evolution.

Motor Company Has Definite Labor Policies

Mr. Stanbrough explained the policy followed by the Packard Motor Car Co. in meeting the present labor conditions. He said that he was to a certain extent responsible for a plant employing 10,000 to 15,000 men, and would limit himself to a discussion of the facts as they applied to his company's plant. The present labor problems as he found them are shortage of supply, unusual turnover, and unrest. Taking up the question of supply of labor, the speaker subdivided this problem under the headings of skilled, semi-skilled and rough labor. To replenish the supply of skilled labor, the Packard company established a shop trade school in which approved machine operators are taken and are taught the next step forward, or to become a job setter. The next step in this work is the education of foremen. The company established a school for foremen in which they are given instruction on the subjects of discipline, premium systems, standard time, tools, safety, sanitation, etc. Lectures are given by the factory executives, and these lectures are published in book form and supplied to the men who take the foremanship course.

The machine operators are classed as semi-skilled workmen. For developing these, a vestibule school was organized, and to this school are sent laborers from the plant, or applicants for jobs. These are kept in the school 10 days, and are trained in production work. Taking up the matter of rough labor, he said that this was a local problem with employers. His experience had been that foreign labor that had been depended on for this class of work had gone into machine work, and his company is now using negro labor, which gives satisfactory results, but conditions must be right in a plant for handling this labor. The speaker said that in the Packard plant 90 per cent of the labor turnover is confined to men who have been with the company less than six months. If a man stays over six months, he is likely to stay for years. Twenty per cent of the men hired do not report for work, but are merely shopping around. If an employee is absent without leave and without accounting for his absence for a period of three days, he is discharged and removed from the pay roll. It is found that this policy is stabilizing employment. The company has a trade test, and 31 per cent of the men claiming experience along certain lines are eliminated. Among the girls 20 per cent are eliminated in the training school as they show that they will not make successful workers.

Mr. Stanbrough contended that foremen must be taught their responsibility in keeping workmen and in putting them on the job properly. He believed that any system that would take from the foreman the responsibility of putting a man on the job would fail. Another means of cutting the labor turnover is the development of company spirit. He said that if a man is proud of his organization, that feeling will go a long ways to keep him on the job. He advocated a centralized organization for hiring, rating and firing. The Packard foremen cannot fire a man but can recommend his discharge to the employment department. A foreman can recommend an increase in the rate, but an increase must be justified by a man's record. That is a check on the foreman to see that the foreman is not favoring any sect or class. A check is also kept on the earnings of a man. If a man cannot earn certain minimum wages, he should be investigated to learn the trouble, and the condition can probably be removed. Labor turnover may be due to the fact that a man is unjustly treated. Skillful interviewers can get at the facts in these cases and turn a man who might not stay on the job into a profitable laborer.

Men Should Be Dealt With as Individuals

Mr. Stanbrough took the same view as Mr. Grieves that men must be dealt with as individuals rather than in masses. He said that that statement cannot be made too strong. Good working conditions must also be provided, and the men given reasonable chances to advance and to express themselves. Executives must be practical men. Executives in the Packard plant from the vice president down advanced from the bench. Any workman can come in and talk to any officer, and many take advantage of this opportunity. He personally could not know 10,000 men, but he can know some in every department, and declared that a man could not spend his time more profitably than cultivating an acquaintance with his employees. He believed that if men were dealt with as individuals, employers would have no trouble.

Mr. Felt gave an interesting talk on labor conditions in England and France, which he visited as a member of the Employees' Industrial Commission. He said that radicalism in England flourishes among the ill informed, or hazy in thought, and the professional workmen. The commission attended labor union meetings, and heard a great deal of talk by the men as to how they would get control of the implements of production, but when questioned, they admitted that they did not expect to get this control soon.

C. O. Bartlett, Bartlett & Snow Co., Cleveland, endorsed statements of Mr. Grieves in regard to the importance of getting to workers. He referred to the Industrial Association of Cleveland which tries to get to the men through the superintendents, foremen and others. This association started three years ago with 400 superintendents, foremen and some manufacturers, and now has a membership of 5000.

Robert J. Andreson, Bowen Products Corporation, declared there was too much talk of centralized control, and that men were inclined to think that some-

thing was being put over on them. He contended that the management should sell its plans to the men or the agitators would beat them to it. L. E. Blythe, Goodyear Tire & Rubber Co., declared that propaganda will be the best thing in the world to meet labor troubles in the future. He referred to the industrial relations plan recently adopted by the Goodyear company, and said that the company was going further in that it was trying to get the confidence of its men in the management. During the recent strike of Akron machinists some of the Goodyear employees went out because they didn't have confidence in the company's industrial assembly, but he did not think that this would happen again.

E. W. Hulet, general manager the White Co., Cleveland, brought out some facts regarding his company's plan of management. He said that during the past 10 years only five people had been employed from outside for 132 executive positions, and these five were in highly specialized fields. He believed that if a way could be accomplished to take care of good men among socialists and organized labor and put them into responsible positions, it would do a great deal to remove present industrial troubles. He believed that the majority of manufacturers wished to go back to 1914 conditions. Up to then factories had a large labor turnover, and many did not object to this, as it was cheaper because employers didn't have to do so much for the men. He said that the turnover in the White factory for the past nine months had been 17 per cent, and that it would be less than 25 per cent in a year. The policy of the company is to control the industry, but to put in efficient management and to go to the bottom and sow the seeds of good-will. He declared there had not been a shortage of labor, but a shortage is coming now and men must be conserved as new men will not be as good as those who leave. The White company is aiming at the community spirit and the home spirit. It is trying to get men to look at good homes and good amusements. It will take five years to get their men to time studies. The company has staked its success on its policy of management. He contended that one-third of the credit for the success of any industry is due to the business men back of it, one-third to the management, and one-third to men in the factory.

Employers, the speaker emphasized, must get a system of organization that will give a square deal to the masses. Neither collective bargaining, unionism nor Bolshevism is the problem. The problem is who is to control. It would be criminal to make men executives until they are trained. A large labor turnover is nothing but an individual strike. He could not say whether his management had the confidence of its 6000 men, as the test has not yet come.

Wrong Viewpoint on Distribution of Wealth

The causes underlying industrial unrest were discussed by George E. Roberts, vice president National City Bank, New York, at the banquet Thursday evening. "The working man reads and is told of vast accumulations of wealth in the hands of a few," said Mr. Roberts. "It is said that 2 or 3 per cent of the people own most of the wealth. He hears of personal incomes that are far beyond the needs of any man or family, and he thinks of these as meaning deprivation to the wage earning class. He thinks of them in comparison with his own income, or the average income, and the comparison is wholly misleading. The right way to measure the distribution of wealth is not by ownership or income, but by consumption. It is only as an individual consumes wealth or uses it exclusively that he deprives other people of it. We talk about capital and income in terms of money, but money is only the medium of transfer. Wealth actually exists in the form of tangible property and in discussing distribution it is better to think of it as people use it."

"The value of the factory," he said, "is for the goods it will turn out and the real distribution of benefits from all productive properties is in the distribution of the goods they produce or the service they render. And right here is where nine-tenths of the misunderstanding over the distribution of wealth arises. The right place to measure the distribution is not at the point of ownership or production, but at the point of consumption. The great consuming public is the chief beneficiary of increasing production. And when you come to measure distribution in this manner you will get a result very different from the representations commonly made. The whole theory that comparatively few people enjoy most of the benefits of existing wealth breaks down completley under examination.

"The whole radical argument is based on the idea that all wealth employed in industry benefits nobody but the owners. It proceeds upon the theory that all the increasing supply of goods and services resulting from the investment of private capital is absorbed and consumed by the capitalists. It assumes that nobody gets any benefit from the progress of industry but the property owners. It is like claiming that nobody ever got any benefits from the development of the steam engine but the owners of the engines.

"You are familiar with the progress of industry, and you know the means by which production has been increased to meet the needs of a growing population and raise the standard of living for the masses. It has been done by improving the methods of production and by the use of power and machinery. It has been done by the development of the industrial plant, and that plant represents the profits and savings of individuals. Those savings and investments have lifted the whole level of social life far above what it was before the industrial revolution, when capital became an important factor in industry. The history of industrial development shows that capital has been a constantly increasing factor in production. In 10 years, from 1899 to 1909, while the population of this country increased 21 per cent, the amount of capital invested in manufacturing increased 105 per cent."

Immigration Restrictions Advocated

H. C. Parmelee, editor *Chemical and Metallurgical Engineering*, gave an interesting talk about conditions in various European countries which he visited recently. He advocated a restriction in immigration and the well-organized system of Americanization. He said that the conditions in Europe today are the outcome of traditional conditions of two or three centuries. Our country has become entangled because the radical doctrines and people who advocate these doctrines got over to this country. While we raise their standards of living, they come over here and live the same old way, and will be sore spots in the body politic. Ingrained in these people is opposition to Government. They come with the demand for high wages and short hours. Our first outlook should be towards immigration. Roosevelt said that immigration should not be restricted if we got the right kind of men. That is the crux of the situation. Americanization work has been adopted in some places, but not nationally. It is our job to raise the downtrodden here, but there are some that should be deported and given an opportunity to raise the downtrodden in Europe. Employers in Europe are waking up, and some employers and employees abroad are thinking along the right lines. Doctrines and people that we do not want here should be kept out. He learned in Italy that there is a large surplus of labor in that country, and believed that while some will go back from this country, there will be a large influx of Italians to America. He said our salvation economically depends on production.

At the concluding session Friday evening an address was made by Rowland B. Mahany, assistant to the Secretary of Labor, who took for his subject "Need of Co-Operation Between Employers and Employees." Mr. Mahany was one of the federal umpires for the War Labor Board during the war, and addressed the society as the representative of the Secretary of Labor. He declared that this is a serious moment in the history of the world, but that the new era will be a period of intelligent altruism. It is not now a question of bread, but of how much bread. The speaker declared that one of the greatest evils today in the relations between capital and labor is the distrust that each has for the other's good faith. Agreements are made and then efforts are made to evade the spirit and letter of

these agreements. He attributed present industrial troubles to lack of good faith on the part of employers and employees, and the tendency to denounce those holding opposite views. He also declared that a great deal of the social unrest was due to the inadequate and unequal distribution of the food supply. The speaker took occasion to refer in eulogistic terms to Secretary of Labor Wilson, declaring that during the five and a half years that he had been associated with him, Mr. Wilson had been guided by the highest sense of public duty, and has inculcated the spirit of fair play among all his associates. Mr. Mahany endorsed the first two declarations adopted by the society, but declined to commit himself on the last two that referred to the compulsory adjudication of labor disputes and the omission of industrial engineers from the President's industrial conference.

M. S. Warfield, Kansas City, Mo., president of the Order of Sleeping Car Conductors, in a paper entitled "Increased Efficiency a Prime Factor in Higher Wages," referred to present-day industrial problems, and said that he had revolutionized the sleeping car service by organizing the conductors and creating a unity of purpose by establishing an efficient machine in which are employed the same methods that are used by a sales manager with his men.

The Luxemburg Iron Industry

The report of the Luxemburg Chamber of Commerce for 1918 on the iron industry in that duchy shows that there had been a continued decline in the output and a regular advance in selling prices, accompanied by a still greater advance in producing costs.

The output of minette ore declined from 6,752,000 tons in 1916 to 3,131,400 tons in 1918. Of 75 minette mines only 34 were working at the end of 1918. In December, 1918, there was a rise in wages from 17 fr. to 19 fr. a day. The average daily output per workman has greatly diminished, and this the report ascribes partly to the bad housing conditions and partly to psychological reasons.

The exports of ore to Germany fell from 509,150 tons in 1916 to 293,800 tons in 1918. The imports from Lorraine also decreased, while those from France rose from 346,559 tons to 376,156 tons.

The pig iron production fell from 1,950,514 tons in 1916 to 1,296,671 tons in 1918, and the crude steel output from 1,296,407 in 1916 to 857,937 tons in 1918. The production of electric steel rose from 15,153 tons to 29,712 tons in the same year. Rolled products fell from 1,189,737 tons to 839,339 tons. The foundries produced 24,571 tons in 1916, and only 19,068 tons in 1918. In the former year the total value of the pig iron production amounted to 205,790,000 fr., as compared with 254,590,000 fr. in 1918. The value per ton rose from 105.54 fr. to 201.10 fr. The total value of the steel output rose from 195,060,000 fr. to 199,570,000 fr. respectively, and the value per ton from 150.51 fr. to 232.61 fr. The following table shows the iron and steel production since 1913 in metric tons:

	Furnaces in blast	Pig iron production	Output of steel	Output of castings
1913.....	45	2,547,861	1,182,227	26,513
1914	47	1,827,270	1,136,495	22,954
1915	47	1,590,773	980,384	16,649
1916.	47	1,950,514	1,296,407	24,578
1917.....	47	1,528,865	1,053 596	23,601
1918.....	47	1,266,671	857,937	19,906

Japanese Turbine Units

Two 25,000 kw. steam-driven turbine units of Westinghouse make, which, when installed, will complete the largest steam-driven electrical installation in the far East, are now being erected at Osaka, Japan, for the Osaka Electric Light Co. Located in an extensive industrial district, this company furnishes light and power to street railways, steel works, shipbuilders, copper refining plants, paper mills, electro-chemical installations and other industries. It is noteworthy that in 1908 the Osaka Co. installed three steam turbine units of 3000 kw. each. In 1910, two more units of like capacity were added, and in 1911 two 5000 kw. units. The 25,000 kw. units now being installed will bring its capacity up to 100,000 hp. All of the above units are of Westinghouse type.

Krupp's Plant to Build Cars and Locomotives

The Bureau of Foreign and Domestic Commerce reports that a recent issue of the *Koelnische Volkszeitung* states that the German Government has given Krupp's a contract for the manufacture and delivery of 100 locomotives and 2,000 15-ton freight cars per year. Full details of this contract are not yet known, but it is reported that the price paid will be based upon the actual cost of the material used and of the labor, and that the factory itself will be allowed only a commission profit of 2 per cent. It is reported that the contract will specify a price for the finished cars and locomotives, and that all profits, which are left after the cost of production and the above-mentioned 2 per cent are deducted, will revert to the National Treasury. Shortly after the armistice convention was signed, Krupp's converted two of its munition factories into railroad rolling-stock factories. The *Koelnische Volkszeitung* states that those two factories have a total capacity of 300 heavy locomotives and 2,500 15-ton freight cars per year.

Electric Iron Smelting in Norway

The Tinfoss Iron Works at Notodden is the only plant in Norway which produces pig iron by electrical means, says the London *Ironmonger*. The works were started in 1910, but could hardly be considered commercial producers until 1913. In 1914 they were successful, but the outbreak of war made it difficult to obtain the necessary raw materials, especially electrodes. The works then established their own electrode plant, the first in Norway, and business improved for a while, until the export of the company's products was practically forbidden. Nearly all the export trade was with Denmark, where the company supplied 42 foundries.

The electrical reduction of iron ore has a favorable future in Norway, especially if methods can be devised which will make it possible to use low-grade ores. The excessively high prices of coal make the use of electricity the only practical method of reducing the Norwegian iron ores. It is believed, however, that the future of the industry will find its greatest success in the development of steel works in connection with the smelters. It is the intention of the Tinfoss Iron Works to erect a steel plant when the cost of construction is more normal.

Trade Information Bureau for Americans in Germany

According to the American Chamber of Commerce in London, an American section has been established in the Military Governors' Bureau for Commerce and Information, which has been operating for some time under the auspices of the British Military Governor at Cologne, Germany. The address is No. 41, Am Hof, Cologne. For American business men going into Germany, this American section will be a clearing house of trade information. The new office, it is understood, exists as a temporary service station for American business men and foreign purchasers. The American section is in charge of H. T. Noyes.

Foreign Trade Convention

The Seventh National Foreign Trade Convention in San Francisco will be held May 12 to 15, 1920. Arrangements have been made for special steamers to bring delegates from the Far East, Australia and South America. The headquarters of the National Foreign Trade Council is the India House, New York.

The *Trans-Pacific*, is a new financial and economic monthly published in Tokyo, Japan and besides dealing with economic subjects, it has instituted a "Service Bureau," designed to give accurate information and statistics and assist in developing business connections in both the United States and the Far East. The *Trans-Pacific* has branches in New York, at 21 East Fortieth Street; and in Chicago, at 2003 Harris Trust Building.

Taylor Society Heeds Post-War Problems

Studies Scientific Management As Guest of Harvard School of Business Administration—War's Lessons Applied to Peace

THE Taylor Society, organized to promote the science of management, was the guest of the Graduate School of Business Administration, Harvard University, Oct. 3 and 4, and held a meeting of four sessions in the Harvard Union. This was the first meeting in nearly two years because all the officers and 50 per cent of the membership were in war work and did not have time to assemble. Announcement was made of the establishment of an office at 29 West Thirty-ninth Street, New York, five months ago and the aims of the office were described, some of them including the becoming of a center of information on scientific management such as Frederick W. Taylor himself was; the directing of young men with industrial careers in view to the best managers; the disseminating of information in this country and abroad.

The society voted to send two telegrams to President Wilson, one wishing him a speedy recovery from his illness and the other requesting that he take steps to have the management branch of industry represented at the industrial conference of Oct. 6 as well as capital, labor and the public. The first session was held Friday evening, with succeeding meetings Saturday morning, afternoon and evening. That of Saturday forenoon took the form of round table conferences, divided into seven groups with as many leaders and topics. The other sessions were addressed by speakers conspicuous in the management end of industry. Dining accommodations were provided in the same building. Members of the society, guests including many wives, and students of Harvard University were in attendance to the number of 500.

Sentiment Strongly Favors Labor's Attitude

There were three outstanding ideas that pervaded the meetings: First, that the war organization experience had taught no principles of management new to the Taylor theory; second, that this period of reconstruction is the appropriate time to reorganize industry and introduce scientific management; third, that labor deserves more consideration than ever before. In regard to the third point there seemed to be uniform sympathy among those present for the workingman's problems, as evidenced in the unusual interest surrounding the address of R. L. Conick, president Rock Island Arsenal Employees' Federation, arsenal employees' representative-at-large, Ordnance Department, which elicited many comments favorable to his somewhat radical ideas in favor of the employee, and evidenced further in the continual rebuttal of arguments presented from the viewpoint of the conservative executive by J. E. Otterson, president Winchester Repeating Arms Co., New Haven, Conn., and also president of the Taylor Society.

Three of the scheduled speakers were not able to be present. They were F. A. Silcox, director Bureau Industrial Relations, United Typothetae of America, Chicago, who was busy with affairs involving the pressmen's strike in New York; also Dr. N. I. Stone, Hickey-Freeman Co., Rochester, N. Y., and Robert W. Bruere, Bureau of Industrial Research, New York.

Two Army Men Talk on War Lessons

The topic of Friday evening was "Organization Lessons of the War," at which the speakers were Lieut. Col. George D. Babcock, Holt Mfg. Co., Peoria, Ill., and Col. J. C. Heckman, consulting engineer Larkin Co., Buffalo, N. Y., both of whom were in the midst of war organization. The outline of Mr. Babcock's address was as follows:

"Organization is the orderly arrangement, adjusted in proper relation and dependence, of a union of individuals into a body whose officers, agents and members work together for a common end. If a common end is sought co-ordination must be accomplished regardless of the extent of operations. It should be accomplished as far as possible without disturbing the administrative functions. This may be accomplished through established standards.

"If standards of very limited duration only are obtainable, or if even limited standards seem unattainable, then co-ordination may well be accomplished through channels auxiliary to those of the administration. This auxiliary service will provide for advice or direct instruction to the administrators respecting such matters as bear upon the common purpose. For the latter condition, if the operations of the organization are extensive, the co-ordinating group may be functionalized such that specialists control each chief function as it threads through the organization.

"The principle of specialists should be applied as far as can be done to obtain a constant maximum return for a given effort. If the amount of work to be done is sufficiently great to entertain an individual or unit of equipment continuously, it should as far as possible be directed to the same individual or equipment. The least amount of work which will provide for such specialized treatment should be segregated under distinct divisions of the organization.

"The administrators of the organization may be selected under one of two principles: Because of specialized knowledge of product, or because of specialized knowledge of the process. From the extreme form of one to the extreme form of the other, all possible combinations of the two may be indicated. As to whether the selection shall be made chiefly on the basis of product or chiefly on the basis of process will be determined by that amount of work which will provide for specialized treatment or by the relative importance of the product or process or by difficulties in the carrying on of the process or of the handling of the product.

"The lessons learned from the recent war respecting this subject are rather in the nature of proofs of previous industrial practices in this country rather than any added knowledge of the subject. The extreme test, however, of such established industrial principles that occurred through this period has materially strengthened our belief in the correctness of these principles."

Great Difficulties in Forming War Organization

Colonel Heckman gave the following opinions: "It isn't appreciated how little a nucleus we had on which to build our war organization. New functions were constantly appearing and screeching for attention. One of the main aims was to get quantity, rather than a character, of personnel and an efficient plan of organization. It was proved that 20 months is too short a time for a war organization to find itself.

"In one conspicuous respect did the war organization differ from any other: The element of cost did not enter, the factor of speed taking its place. In no other business can cost be so subjugated. I was impressed with the necessity of definition of functions and thorough understanding of each department. People too often think that a neat organization chart makes an organization. The danger of a chart is that it prevents flexibility and therefore needs to be kept up to date. The simpler the organization may be, the better it will do its work.

"There was too much talent in some groups—similar to the Mexican army, where all are generals. The members themselves must be thoroughly 'sold' on their organization scheme. In a large organization the details should be decentralized or removed from the supervision of the head, as fast as progress will warrant.

With a small organization decentralization is not necessary."

Round Table Discussion of Unemployment

In view of the importance of labor as a factor in industry, one of the most interesting topics of the round table conference was that on "Planning Regularity of Output to Reduce Unemployment," conducted by Colonel Babcock. The necessity for the workman to be versatile so that he can be turned over to other operations when his regular operations are temporarily suspended was continually emphasized. Several systems to reduce this "unemployment within employment" were explained by those present. Mr. Babcock outlined that of the H. H. Franklin Mfg. Co., Syracuse, N. Y., with which company he was formerly connected, whereby the manufacture of parts is pushed during the winter whereas the assembly of these is rushed at the time of demand for deliveries. Thirty per cent of the assembly work is reduced during midwinter. In some plants where workmen learn other processes they receive a bonus in salary. In some plants there is a card in the main office for each workman on which is listed the operations which he has proved he can perform. Some one suggested that a term be invented for "unemployment within employment" and that a formula be devised for determining it much as formulas had been presented for computing the "labor turnover."

In the afternoon Prof. Felix Frankfurter of the Harvard Law School, special assistant to the Secretary of War, chairman of the War Labor Policies Board, who made two missions abroad for the Secretary of War, said in part: "One observes all over the world a general dissatisfaction. It is too bad that Europe can't be put to sleep for six months. Lord Robert Cecil—and he has the best idea of the world's economic conditions with the exception of Herbert Hoover—said the present unrest of labor was not a matter of wages or hours; that workmen complain—not because their conditions of work are bad—but because they have no 'say' as to what those conditions should be. The same is true in industry as in the Government—the workmen want a share in the management."

Industrial Relations in the Government Arsenals

Capt. O. S. Beyer addressed the audience on industrial relations in the arsenals of the ordnance department, but because of the policy of the Government, requested that printed publicity be withheld on what he should say. His talk was particularly interesting because of the wide concern in the Government's experiment in giving labor more representation in management than prevails elsewhere. The speaker was enthusiastic over results thus far, as witnessed in the Rock Island arsenal with which he has been connected. Captain Beyer was formerly mechanical engineer with the Midvale Steel & Ordnance Co., and has since had experience with several railroads.

R. L. Cornick, president Rock Island Arsenal Employees' Federation, advanced strong arguments in favor of labor's attitude in the present period of industrial unrest. In part, he said:

"The present labor problem is a question of psychology. Though 'radicals' are receiving universal condemnation, it must be remembered that it is through 'radicals' that all steps forward in world progress have been made. I stand squarely for the labor movement. All co-operation must be voluntary. When labor can be shown that increased efficiency on their part will broaden, not restrict, their field of opportunity, then and then only will they co-operate fully.

"The workmen in the arsenals have demonstrated that they have men of exceptional ability. There is a new spirit among our employees—they no longer feel like employees, but partners, and we no longer have grievances. These fellows have developed production men among themselves and they realize the necessity of calling in production experts.

"The main trouble in most industries is that employers having joint councils try to dictate to employees what type of men they are to choose to represent them. This we do not do. Then, again, many employers will take a paternalistic attitude in what they do for their employees, instead of the attitude of a partner. Employers have failed to realize that they were dealing with humans; that they have to go farther than considering mere production. Employees have as much invested in industry as a whole as the employer himself. However, when it comes to sharing the fruits of industry the usual ratio is ten to one, labor getting the 'one.' We are asking for merely '50-50.' No group has the right to decide for another group what its standard of life shall be by deciding the amount of wages. I think that production can be so regulated that there will be plenty of wealth for everybody and at the same time the employer may get more than he is getting now."

Industrial Conditions from the Employers' Viewpoint

The concluding speech was that of J. E. Otterson, president Winchester Repeating Arms Co., New Haven, Conn., and he said: "We face a time as critical as that when our forefathers framed the Constitution of the United States. I think it appropriate that this experiment of shop committees as worked out in the arsenals be tried out under the Government operation rather than in private industry. I attribute the present uncertain period to three factors: Psychology, economic conditions and sociological conditions.

"The war left the people in an irritable, excitable, emotional, almost hysterical state, so that now the people are peculiarly susceptible to new doctrines. War taught people to take by force what they do not possess by right and there is secret propaganda in this country to obtain sympathy for the Russian situation. The restraint we practised during the war has now been relaxed; then we practised thrift, while now we are indulging in extravagance. I think the world's disease is acute, not chronic. I think the ways of executives must be modified to deal with this condition—the same as though they were dealing with a person suffering from a mental disorder. This is no time to relax discipline, but rather to make discipline milder.

"Before the war raw material and foodstuffs were plenty and cheap. But the war demand was abnormal and raised prices. There developed an abnormal market for labor because of the keen bidding for it among employers. The process must now be reversed to bring things back to normal. When cost of raw materials and foodstuffs decline, wages may. If wages do not decline there must be a corresponding increase in productivity.

Ways of Getting Back to Normal Conditions

"I believe that we can get back to normal conditions by several, or all, of the following means: Reducing wages, increasing production, bettering management, bettering distribution, improving mechanical processes through inventive genius. The majority of workmen realize the importance of increased productivity. Too many, though, consider high wages as means to luxury rather than as the just fruits of increased productivity. Which is the more harmful, by the way,—undue indulgence in alcohol or undue indulgence in leisure?

"I think that the surplus produced belongs to neither capital nor labor, but to future generations. Highly paid management is not justified unless it produces on a scale comparable with what it is paid. It is the duty of the public, through personal thrift, to do away with the present era of extravagance.

"There are three classes to-day: The constructionists, the reconstructionists and the destructionists; expressed differently, the conservatives, the progressives and the radicals. The only hope of the destructionists is to combine with the reconstructionists. However, the right plan is for the constructionists to combine with the reconstructionists.

"In the industry I represent I would dread a referendum to workmen on matters of management and policy at this time. I do feel that with some training they might make progress. I wouldn't mind trying it on a small scale in the laboratory sense, but I would hate to apply it largely to any private industry.

"I think that our future competition lies with Germany and Japan, both of whom will exploit the natural resources of Russia and hence be on a par as to opportunities with the United States. Then it will be a competition of labor. We will have American ingenuity against German industry and Japanese power of imitation and adaptability."

In the discussion which followed Mr. Cornick refuted some of Mr. Otterson's statements. He said that a man who is willing to admit the principle of democracy in industry should be willing to apply it to his own industry. He stated that the men who drew up the Constitution of the United States were revolutionists. He made the striking statement that in the near future we can produce all the world needs by working only one or two hours a day. The rest of the day the workman will spend in reading and educational pursuits to improve his mind and efficiency. There were several other spirited criticisms of points brought out by Mr. Otterson. One individual made the resolution that the society go on record as favoring in every respect the plan for treating labor in the Government arsenals, but the motion was quashed on the grounds that the society had not studied the plan in detail and was not informed enough to pass judgment.

Financing Home Building

The Graton & Knight Mfg. Co., Worcester, Mass., manufacturer of leather belting and leather specialties, announces a plan for assisting its employees in financing home building. The company had been for some time assisting its workers in this way, but not on an organized plan such as has just gone into effect. In the beginning, the amount of the fund as represented by total loans shall not at any one time exceed $50,000. Loans on first or second mortgages will be made to employees, no loan to exceed $3,000 and not in excess of 65 per cent for the first mortgage or 35 per cent for the second mortgage, of a fair value of the property.

Loans will be financed as follows: First mortgage will, if possible, be secured from a savings bank. Employees must furnish at least 5 per cent of cost in cash. The rest will be furnished by the company on second mortgage at 6 per cent interest. Employees will agree to pay a certain sum per week, which will be sufficient to cover the following: Interest on first mortgage to savings bank, taxes, interest on second mortgage, reduction of second mortgage at the rate of at least 5 per cent per year. This amount will be deducted weekly from the employee's wages as long as he is employed by the company.

In case of sickness of an employee or for other good cause, the weekly payments may be reduced by the committee having the system in charge, providing that the amount payable for any six months' period shall not be less than the interest and taxes for such period.

In case the employee leaves the employ of the company and fails to pay the weekly installments, the company may, after due notice, take over the property. In such case the amount paid in reduction of the mortgage shall be refunded, providing the property has been maintained in proper condition. If the property can be resold, the entire amount received in excess of the amount due for mortgages, interest, taxes, etc., shall be paid over to the employee. In case of the death of an employee the heirs shall have the right to continue the payments, and in default of such payments the property shall be taken over by the company under the same terms as in case of leaving the employment. The statement to employees contains provision that the system of loans will apply not only to houses privately built but to houses which employees buy in connection with the plan of the Worcester Housing Corporation, which is building groups of three and two apartment houses in various atractive neighborhoods of Worcester.

Combining Engineering Societies Locally

For the purpose of furthering engineering co-operation in public affairs, development committees of the American Institute of Electrical Engineers, American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers and the American Society of Mechanical Engineers, are conferring relative to joint action by the several societies. The American Institute of Electrical Engineers, through its committee on development, recommends that the national societies establish and support local sections to include all the worthy engineering bodies; that where such federations are organized there be established under an appropriate name a federated local council of engineers to be made up of representatives from the different locals; that there be established a direct touch between each local federated council and a national engineering council composed of delegates from as many national engineering societies as are willing and worthy to participate; that through the medium of the national and the local federated councils there be perfected a working arrangement for engineering co-operation in all public affairs where such is desirable; that there be inaugurated the custom of periodically holding an engineering congress to consider matters of general interest to engineers and to the public.

Foundry Fire Prevention Code

Fire prevention regulations have been tentatively summarized by the Committee on Safety, Sanitation and Fire Prevention of the American Foundrymen's Association, as follows:

1.—All foundry, pattern and storage buildings shall be of fire resisitive construction.
All pattern shops, storage buildings, warehouses, and offices shall be equipped with sprinkler systems.
2.—All pattern storage buildings shall be subdivided by fire walls.
3.—All sections of foundries devoted to the cupola, air furnace, converter, crucible, open-hearth or electric furnaces, shall be entirely of fire-resistive construction.
4.—Foundry cupboards should all be of metal construction.
5.—It is recommended that metal flasks shall be used in place of the present wooden flasks, as required, this being a step toward the conservation of wood and also a prevention against fires, witnin the foundries.
6.—All oil stores shall be kept within metal containers in fire-resistive oil houses.
7.—All foundries shall have organized fire brigades.
Hold brigade fire drills at irregular intervals, at least once a month.
Have written reports of all brigade drills and fires.
8.—Fire hose shall be used for fire protection purposes only.
Keep all fire appliances clean and accessible, and see that they are constantly ready for use.
9.—Provide brigades with modern means for fighting fires.
10.—Have regular inspections made for fire hazards.
11.—See that electric wiring is kept in repair and not abused.
12.—Guard against spontaneous combustion in stock, as fires may start from this source. Spontaneous combustion is a hazard from which fires may start in the fuel and oil used in mixing the cores. Linseed oil is very dangerous as regards spontaneous combustion if it comes in contact with rags, sacking, waste, or other substances. Spontaneous combustion is also a hazard where accumulation of oil and waste and oily overalls occur in tool cupboards and lockers.

Tungsten Production in Siam

Vice-Consul Carl C. Hansen at Bangkok, reporting to the Department of Commerce on the tungsten mining situation in Siam, asserts that the potential production of tungsten is unlimited, and that the ore is widely diffused throughout the Siamese Malaya and northern Siam. During the war the price reached about 160 ticals ($60 gold) per picul (133-1/3 lb.), while at present (June, 1919) it is about 40 ticuls ($15) or less per picul. Official information is not available in regard to the destination of the tungsten ore exported from Siamese Malaya, but it is understood that nearly the entire output the first two years of the war period was reserved for the United Kingdom, France sharing to some extent in 1918. The shipments of tungsten through the port of Bangkok to the United States in the fiscal year ended March 31, 1917, amounted to 131,040 lb., and to 44,800 lb. in the fiscal year 1917-18. The production of tungsten practically ceased with the beginning of the present year.

A device for use with twist drills up to ¼ in. in diameter, and intended to prevent the drills from breaking is made by Brown Brothers, Great Eastern Street, London, England. It is a sleeve of brass slotted for the greater part of its length, which slides snugly upon the drill, leaving just so much exposed as may be needed.

Judge Gary's Position on Labor Indorsed

Thirteen Hundred Members of the American Iron and Steel Institute Heartily Applaud the Steel Corporation Chairman and Indorse the Position Taken in Washington

AT the meeting of the American Iron and Steel Institute at the Hotel Commodore, New York, Oct. 24, there was a record breaking attendance, there being fully 1300 at the morning meeting and 1250 at the banquet in the evening.

When Judge Gary appeared in the large assembly hall at the hotel, the 1300 men who crowded into it arose and applauded for a number of minutes while the judge walked to the speaker's stand and then stood waiting until the demonstration subsided. When he was able to be heard, he said, "I feel that this hearty greeting is on account of the principles for which I stand rather than for myself and yet I trust you will never fail to realize that I appreciate the great personal kindness that you extend to me."

At the conclusion of his address which was frequently interrupted by applause, Joseph G. Butler, Jr., Youngstown, Ohio, in a few appropriate words, offered the following resolution:

WHEREAS, Elbert H. Gary, President of the American Iron and Steel Institute, has rendered to the American people and the American iron and steel industries, a service of inestimable value by his course as a representative of the public in the industrial conference at Washington; therefore

Be It Resolved, that the American Iron and Steel Institute, assembled in its semi-annual meeting, hereby records its unqualified approval of Mr. Gary's firm stand against any infringement of the rights of the individual in labor or in business, rights fundamental to American industrial supremacy as well as to American liberty; that it admires the vision and courage enabling him to discern and effectively oppose the radicalism injected into trade unionism by unscrupulous leaders, an element especially dangerous under present conditions, when world-wide unrest has created an opportunity for agitation aimed at the perpetuity of institutions under which our country has achieved its strength and our industries attained their efficiency and prosperity.

The resolution was unanimously adopted and Judge Gary then said:

"Gentlemen, I thank you. I would be less than fair and less than sincere if in this connection I failed to emphasize the thought that while circumstances have happened to place me in a position which has centered your thoughts and your words of approval upon me, yet there is not much strength in anyone who happens to be prominently connected with or the leader of a movement unless he has the necessary support. And therefore I want to share the very generous confidence which you have expressed in words with large numbers of others.

"I would like to say that from the outset the positions which have been taken by your president, as expressed in words, has been without exception approved by the finance committee of the United States Steel Corporation, by its board of directors, by its stockholders as stated in many letters and telegrams which have been received, by the board of directors of this splendid institution, of which we are all proud, by the iron and steel industry generally of the United States and Canada, by thousands upon thousands of individuals, chambers of commerce, associations and organizations, including farmers' institutions, scattered all over this country, from north to south and east to to west; and I am glad to say by the intelligent, influential, splendid press of this country.

"And so you and I, all of us, cheerfully, emphatically extend the sentiments of the resolution which has been passed to all these groups of individuals to whom I have referred."

In his address, Judge Gary said:

"The attention of the members of the American Iron and Steel Institute has of late been focussed on the attempt of leaders in the American Federation of Labor to unionize the iron and steel industry of this country.

"The present campaign was started at St. Paul, Minn., June 13, 1918, by the adoption of a resolution introduced by delegate W. Z. Foster, couched in the following language:

WHEREAS, The organization of the vast armies of wage earners employed in the steel industries is vitally necessary to the further spread of industrial democracy in America; and

WHEREAS, Organized Labor can accomplish this great task only by putting forth a tremendous effort, therefore, be it

Resolved, That the executive officers of the American Federation of Labor stand instructed to call a conference, during this convention, of delegates of all international unions whose interests are involved in the steel industries, and of all the state federations and city central bodies in the steel districts, for the purpose of uniting all these organizations into one mighty drive to organize the steel plants of America.

The movement appears to have proceeded, under the general direction of Foster, without much result until June 13, 1919, when another resolution was adopted by the American Federation of Labor at a meeting held in Atlantic City, which reads as follows:

WHEREAS, Every labor union in America, regardless of its trade or industry, has a direct and positive interest in the organization of the workers in the iron and steel industry, because the accomplishment of this vital task will greatly weaken the opposition of employers everywhere, to the extension of trade unionism and the establishment of decent conditions of work and wages; and

WHEREAS, The organizing force now in the field working upon this vast project is altogether inadequate in strength to carry on the work in the vigorous manner imperatively demanded by the situation; therefore, be it

Resolved, That President Gompers of the American Federation of Labor, and chairman of the national committee for organizing iron and steel workers, be authorized to call a conference, during the convention of the American Federation of Labor of the heads of all international unions affiliated with the A. F. of L., to the end that they make arrangements to lend their assistance to the organization of the iron and steel industry.

The Strike and Its Leaders

President Gompers thereupon named the heads of 24 affiliated organizations to act as a committee to develop and carry out plans for unionizing the iron and steel industry pursuant to the resolutions mentioned. You are familiar with what has occurred since that time and you are more or less acquainted with the history of the different union leaders who have been connected with the attempt to enlist the employees and to bring about a strike in the manufacturing works. The strike, which has been directed by the union labor leaders was begun, so far as I am informed, without any request or authorization from the workmen themselves, has been conducted in the usual way. Immediately preceding the day fixed for ordering out the men, intimidating letters, large numbers of them being anonymous, were sent to the families of the workmen threatening physical injury to the father or husband, damage to or destruction of the home and kidnapping of the children unless the employee referred to should obey the order to strike. A number of the workmen, who had joined the unions voluntarily, accepted the order to strike and others remained away from the factories through fear. In many, if not most of the mills, the larger number of employees continued to work without interruption. At the beginning many of the workmen who attempted to continue their work and others who had remained at home through fear and attempted to return, were confronted in the public streets and elsewhere by strikers, or pickets, and importuned to engage in the strike; and many were assaulted and seriously injured. After protection was afforded by the police, sheriffs' deputies, state constabulary and, in some cases, state or national troops, the

numbers resuming work increased appreciably from day to day until in many places operations are about normal. Taken as a whole, the situation at present is good and steadily improving.

"It will be observed that the strike is not the result of any claim by any workmen for higher wages or better treatment nor for any reason except the desire and effort on the part of union labor leaders to unionize the iron and steel industry. As stated in the first resolution, the action was "for the purpose of uniting all these organizations into one mighty drive to organize the steel plants of America.

Aim of the Unions

"Without discussing for the present the merit or demerit of labor unions it may be observed that union labor leaders openly state that they seek to unionize or, as they say, 'organize' the whole industry of this country. Those who do not contract or deal with unions, although they do not combat them, insist upon absolute freedom to both employer and employee in regard to employment and the management of the shops. The non-union employers and employees both stand for the open shop. The unions argue for the closed shop or, as the leaders now insist, 'the right of collective bargaining through labor union leaders.' Every proposition contended for by the labor unions at the National Industrial Conference at Washington led to domination of the shops and of the men by the union labor leaders. Every position taken by the other side centered on the open shop. This is the great question confronting the American people and, in fact, the world public. From 80 per cent to 90 per cent or more of labor in this country is non-union. It is for them and the employers generally and the large class of men and women who are not, strictly speaking, employers or wage earners, to determine whether or not it is best for the whole community to have industry totally organized. Judging by experience, we believe it is for the best interest of employer and employee and the general public to have a business conducted on the basis of what we term the 'open shop,' thus permitting any man to engage in any line of employment, or any employer to secure the services of any workman on terms agreed upon between the two, whether the workman is or is not connected with a labor union. The verdict of the people at large will finally decide this question, and the decision will be right.

The Fundamental Question

"I think the fundamental question submitted to the conference for recommendation to industries was the open shop; that question apparently could not be decided by majority vote for the reason that the conference was organized into three groups called Labor, Employers and Public. No affirmative action under the constitution or adopted rules could be taken except by the unanimous vote of the three groups, each of which voted by a majority of all its members. It was necessary to have such a condition as otherwise there could be no conference in which there would be an agreement between capital and labor, so-called.

"The union labor advocates stand for collective bargaining through the unions. The others favor collective bargaining through representatives selected by the employees themselves from their own members. The Employers' Group offered the following resolution:

> RESOLVED: That, without in any way limiting the right of a wage earner to refrain from joining any association or to deal directly with his employer as he chooses, the right of wage earners in private as distinguished from Government employment to organize in trade and labor unions, in shop industrial councils, or other lawful form of association, to bargain collectively, to be represented by representatives of their own choosing in negotiations and adjustments with employers in respect to wages, hours of labor, and other conditions of employment, is recognized; and the right of the employer to deal or not to deal with men or groups of men who are not his employees and chosen by and from among them is recognized; and no denial is intended of the right of an employer and his workers voluntarily to agree upon the form of their representative relations.

"The Employers' Group voted in favor of this resolution. The Public Group and the Union Labor Group voted against it. The Public Group offered the following resolution:

> The right of wage earners in trade and labor unions to bargain collectively, to be represented by representatives of their own choosing in negotiations and adjustments with employers in respect to wages, hours of labor and relations and conditions of employment, is recognized.
>
> This must not be understood as limiting the right of any wage earner to refrain from joining any organization or to deal directly with his employer if he so chooses.

"The Public Group voted in favor of this resolution. The Employers' Group and the Union Labor Group voted against it. The Union Labor Group finally offered the following resolution:

> The right of wage earners to organize without discrimination, to bargain collectively, to be represented by representatives of their own choosing in negotiations and adjustments with employers in respect to wages, hours of labor, and relations and conditions of employment is recognized.

"It was stated by Mr. Fish of the Employers' Group that 'we cannot read this resolution without reference to the history of the last two weeks, and the events of yesterday. * * * As the argument in this conference has developed, it has been perfectly clear that the sum and substance of the resolution with reference to collective bargaining that have been presented heretofore, excepting the substitute from the Employers' Group, the Chadbourne resolution and the substitute offered for it by the Employers' Group, that these resolutions in substance meant this and nothing else, that this conference is asked to take action which will force, if possible, the hundreds of thousands of employers in industries throughout this country to recognize the labor unions whether they will or will not, and to force their organizations to deal with the labor unions against their will. * * * I shall personally feel obliged to oppose this resolution unless there is a plain definition as to what is meant by bargaining collectively.'

Labor Group Retires

"The Union Labor Group and the Public Group voted in favor of the resolution. The Employers' Group voted against it. Thereupon the Union Labor Group retired from the conference.

"All through the conference, wherever the question of collective bargaining was discussed, it was apparent that the union labor leaders would not support any resolution in favor of collective bargaining except on the basis that collective bargaining meant bargaining through labor unions. For instance, on Tuesday when the two first resolutions above quoted were under discussion and ready for vote, Mr. Chadbourne for the Public Group spoke as follows:

> Mr. Chairman, I want to make a statement and to ask a question or two of Mr. Gompers with the Chairman's permission. (Turning to Mr. Gompers.) Mr. Gompers, the Public Group will retire and reconsider its vote, with the recommendation of its Chairman, Mr. Baruch, if you and your group will do either one of two things: either add, "or other organizations" after "labor and trade unions," in the resolution, or give it as your group's interpretation upon this record equally as solemn as the vote that is taken upon the resolution, that it is the interpretation of the gentlemen in your group that it does mean any other organization or any other association.

"To this the Union Labor Group would make no response. As further evidence of the attitude of the union labor leaders, it may be mentioned that in the 12 points published by the union labor leaders who were conducting the strike they insisted upon the following: *Abolition of company unions.*

Forced to Join Unions

"The unions claim that collective bargaining through different forms of shop organization made up of the employees tends to limit the extension of unions by increasing their numbers. The non-union employees and their employers insist that collective bargaining through labor unions means that employees are forced to join the unions as othrewise they could not be represented. So it is perfectly clear that the whole argument returns to the main proposition of open or closed shop.

"In the conference there was no objection offered by

any one to a form of collective bargaining as between employees and employers, provided both were free from outside representation and direction.

"The Labor Group so-called was made up of union labor leaders, leaving unorganized labor without special representation. The same mistake seems to have been made by a large portion of the public which was made throughout the war, namely, that organized labor really represents the workmen or wage earners generally, notwitsthanding that, as a matter of fact, at least 85 per cent of the total are non-union—not members of any union organization. The Employers' Group, in which were men first class in every respect, included men connected with large and important lines of industry, and also included several others, some of whom at least should have been with the Labor Group. In selecting the Public Group there were overlooked thousands of vocations, professions, artisans and other lines of industry, all more or less affected by the cost of production, the expense of living and, therefore, the control and conditions of both labor and capital.

Many Subjects Neglected

"However, it would seem there were many objects which might appropriately have been considered by the conference and conclusions for recommendations arrived at by unanimous consent which would be advantageous to the public good and, therefore, to all mankind, such as working hours, living and working conditions, women's work, child labor, recreation, medical and surgical treatment, pensions, relief in times of stress, rates of compensation, schools, churches and other educational facilities. With the right disposition and intelligence the Public Group, sole survivor of the conference, can agree upon recommendations to the industrial world which should be of substantial benefit. All of us are in favor of these principles and of any others that may be suggested which we believe will be of real benefit to the wage earners and to the general public.

On a High Plane

"I conceive it to be proper in this family of industrial workers consisting of 2000 members of the most important basic industry, to claim that we have demonstrated in practice we are upon a plane which is higher and better than ever before occupied by this industry in this country; that we have been striving to deserve the approval of all who are interested in our business and our decisions; that we have sought the confidence of our employees, our customers, our competitors, our principals who own the properties we manage, and the general public.

"And yet it would be unfortunate if we could not discover opportunities for further improvement; if we failed to read or to listen to the criticisms of others; if we let pass the requests or suggestions of our workmen for changes which they believe would be proper concerning their employment; if we neglected to give our employees ,individually or in groups, opportunities to discuss with the managers all questions of mutual interest; if we minimize in any degree the well recognized fact that the public good is of prime importance and that private interests must be subordinated. It is a pleasure to me to know from long experience that I am appearing to a sympathetic audience in behalf of a continued effort on our part to be more worthy of the respect and confidence of every right thinking person who is familiar with our industrial life.

Treatment of Bolshevism

"Considerable has been said in public of late concerning the attempt to spread the doctrine of Bolshevism in this country. All of us have known for some time that this disease is persistent and that there has been some inoculation even in this best of countries. Still we deny that there is danger of serious trouble. There is only one way to treat this disease and that is to stamp it out, to meet it boldly wherever it can be found, to expose it and give it no chance for development. In this free country, with its reasonable laws wisely administered, its golden harvests, healthful climate, peace-loving inhabitants who are generous in contributions for relief and protection, schools, churches and hospitals, there is no room except in the prisons for the anarchist, the bolshevist or other individual who seeks to substitute the rule of force for the rule of law and reasons. If there is slinking, desperate, murderous bolsheviki in this country, even in small numbers, I believe the Secret Service Department of the Government should detect and expose them and that the iron hand of justice should punish them as they deserve, and as I have faith in this country and its institutions, I believe this will be done and done promptly. Any one who doubts the ability of the proper authorities to protect the person and property of our people against bolshevism and other similar doctrines, fails to appreciate the courage of our citizens and the terrible force and strength of subdued calmness when they are surrounded by threatened danger.

"For our selves, let us be fair and just, considerate and determined, hopeful and complacent. We shall emerge from the waves of unrest which naturally follow the demoralization and terrors of war and as a people will be better and stronger than ever."

Organizing Association for Researches in Alloys

The Division of Industrial Research of the National Research Council is arranging for the formation of a co-operative association to plan and support fundamental researches in alloys. Although much valuable work has been done in this field by scattered investigators, it is expected that a co-operative association working under the general guidance of the National Research Council and composed of specialists representing both the manufacturers and the more extensive users of alloys can produce additional results of great importance. The success of other industries which have supported research on a co-operative plan, such as has been done by the National Canners' Association and the Malleable Iron Manufacturers, is evidence of this.

It is planned to create a special scientific staff composed of a director and assistant director of research and a group of scientific investigators and technical experts who shall give their whole time to the work. To finance the organization each member of the co-operative association will pay $1,000 a year, and all contributing members, who may be either alloy manufacturing or using individuals, firms or companies, are to benefit alike by the results of the researches.

Journal of the American Welding Society

Publication of the "Journal of American Welding Society" has been inaugurated with the October issue. The purpose of the publication is explained as follows: "The movement toward the scientific advancement of welding conducted by the Emergency Fleet Corporation, and now, since necessarily dropped by the Government, in the hands of the American Welding Society, has reached a stage where its proceedings should be regularly published. It is for this purpose that this journal has come into being." Information on various welding methods is included in a number of articles, such as "A Theory of Metallic Arc Welding," by Ralph G. Hudson; "Gas Welding and Cutting During the War," by H. Sidney Smith; "The Effects of Heat on Iron," by Gerald W. Hinkley.

Boiler Workers Addition

The Gerstner Boiler Works, Inc., Pittsburgh, has increased its capital stock from $100,000 to $200,000, to take care of its increasing business, and the company is adding a steel building 100 x 220 ft. to its present plant. Orders now being filled by this concern include 152 portable boilers to be shipped to the Western oil country, also 30 steel locomotive tanks for export, and a large order for steel ship masts for 16 vessels. This company also maintains a small plant at McDonald, Pa., equipped for the re-ending of boiler tubes exclusively, under a process patented by the company, and it states this plant is also running to full capacity.

The Pacific Coast Steel Co., in connection with the plant which it now has in operation at Portland, Ore., has offices in the Northwestern Bank Building, Portland.

FERROMANGANESE SUPPLIES

Domestic Output About Half War Production—Spiegeleisen Output Low—Manganese Ore

Domestic production of ferromanganese in the third quarter of this year was 36,118 gross tons or 12,039 tons per month, according to the blast-furnace reports of THE IRON AGE. This compares with 16,854 tons per month in the first half of 1919, revealing a gradual reduction.

The output of spiegeleisen has changed but little. For the third quarter it has been 5579 tons per month as against 5762 tons per month in the first half.

The following table gives the production of both alloys for the first nine months of this year and a comparison with previous years in gross tons:

Production of Ferromanganese and Spiegeleisen

1919	Ferro-manganese	Spiegeleisen	Total
First half	101,123	34,572	135,695
July	10,874	3,931	14,805
August	9,268	8,151	17,419
September	15,976	4,655	20,631
Total to Oct. 1	137,241	51,309	188,550
Aver. per mo. to Oct. 1	15,249	5,701	20,950
Av. per mo., first half	16,854	5,762	22,616
Aver. per mo. in 1918	28,775	20,775	49,525
Aver per mo. in 1917	21,486	16,107	37,222
Aver. per mo. in 1913	9,958	10,507	20,464
5-year aver., 1910 to 1914	8,280	.....	.....

The present rate of output of ferromanganese of 15,249 tons per month is still considerably larger than the pre-war output as the above table shows while the spiegeleisen production is only about half the pre-war rate of 5701 tons per month as against 10,507 tons per month before the war.

The October production of ferromanganese was 15,164 tons and that of spiegeleisen, 5074 tons.

Available Supplies of Ferromanganese

The available ferromanganese supplies for the first nine months of this year are shown by the following table of output, imports and exports:

Available Supplies of Ferromanganese

1919	Output	Imports	Exports	Available Supplies
First half	101,123	15,312	1,207	115,228
July	10,874	1,081	555	11,400
August	9,268	601	283	9,586
September	15,976	1,655	3	17,628
Total	137,241	18,649	2,048	153,842
Aver. per mo. to Oct. 1	15,249	2,072	227	17,094
Aver. per mo., first half	16,854	2,552	201	19,204
Aver. per mo., 1918.	28,775	2,264	298	30,741
Aver. per mo., 1917.	21,486	3,703	776*	25,413
Aver. per mo., 1915.	12,021	4,605	....	.....
Aver. per mo., 1913.	9,958	10,672	....	.....
5-year aver., 1910 to 1914	8,280	8,399	....	.....

*Last half only.

Despite the fact that all restrictions have been removed, imports of British alloy continue small, having been only 2552 tons per month in the first half and only 2072 tons per month to Oct. 1.

Imports of Manganese Ore

Imports of manganese ore are slowly declining. Imports in the third quarter of this year have been much below those of the first half and considerably less than the monthly average in 1913 when they were 28,757 tons per month. The following table gives the data as to manganese ore imports into the United States:

Manganese Ore Imports

1919	Total	Monthly Average
First half	225,985	37,664
July	15,585	.....
August	8,246	.....
September	19,601	.....
To October 1	269,411	29,935
Calendar year, 1918	491,303	40,942
Calendar year, 1917	629,972	52,498
Calendar year, 1915	320,784	26,732
Calendar year, 1913	345,084	28,757

British supplies of manganese ore are not expanding, having been only 24,209 tons per month to Nov. 1, 1919, as against 29,687 tons per month to Nov. 1, 1918 and 50,098 tons per month in the calendar year of 1913.

Plan Tariff on Chromium Compounds

WASHINGTON, Dec. 2.—Representative Kahn, of California, has introduced a bill to levy a protective tariff duty on imports of chrome ores and their products. The proposed duty is itemized as follows:

First, on crude chrome ores and chromium ores and concentrates thereof, the sum of 60c. per unit of Cr_2O_3 content therein contained, a unit being defined as being 1 per centum of Cr_2O_3 contained in a net ton of 2000 lb.

Second, upon ferrochrome, and other metallic alloys containing chrome, 11½c. for each pound of metallic chromium contained therein.

Third, upon refractory brick and material used for refractory purposes containing chrome, the sum of 65c. per unit of Cr_2O_3; a unit being defined as being 1 per centum Cr_2O_3 contained in a net ton of 2000 lb.

Fourth, upon chemical compounds and articles manufactured therefrom containing chrome or chromite, 90c. per unit of chromium content; a unit being defined as being 1 per centum of chromium contained in a net ton of 2000 lb.

Contracts for Follansbee Sheet Mill Buildings Are Awarded

PITTSBURGH, Dec. 1.—The Follansbee Brothers Co., Pittsburgh, which will build a new sheet mill plant at Toronto, Ohio, has placed the contracts for the main buildings with the Belmont Iron Works, Philadelphia. These comprise a 180 x 360-ft. open-hearth building, a 100 x 300-ft. bar mill, ingot and furnace building, a 140 x 880-ft. hot mill, a 92 x 820-ft. annealing building, a 60 x 300-ft. scrap shed, and a 75 x 500-ft. wareroom. The company is doing its own grading for the new plant. So far the contracts for the buildings are the only ones that have been placed. The company expects to give out contracts for the electrical equipment and other machinery within the next two weeks.

Corporation Railroads Declared Common Carriers

WASHINGTON, Dec. 1.—The Interstate Commerce Commission has declared that the Newburgh & South Shore Railway Co. of Cleveland, owned by the American Steel & Wire Co., and the Union Railroad Co. at Pittsburgh, owned by the United States Steel Corporation, to be common carriers, "subject to the act of regulate commerce and may lawfully receive from their trunk-line connections divisions of joint rates or absorptions of switching charges, under appropriate tariffs, such divisions or absorptions to be reasonable."

Pig Iron Released from Embargo

WASHINGTON, Dec. 2.—The British Government has released pig iron from its embargo list, according to a cablegram from Consul General Hollis to the State Department. The Administrative Board of the Import and Export Commission at Prague has also announced that pig iron may now be imported into Czecho-Slovakia without license formalities.

Increased Activity at La Belle Iron Works

La Belle Iron Works, Steubenville, Ohio, has more than 2000 men at work at present, and is operating one of its two blast furnaces, six of its 11 open-hearth furnaces and also some finishing mills. Its Koppers by-product coke plant across the river from Steubenville is also in operation. This company expects to be running practically full by the first of the year.

Long Strike Ended

The Globe Iron Co., Jackson, Ohio, manufacturer of Bessemer ferrosilicon, states that its men have returned to work after being on strike since July 7, and its blast furnace is again in operation. The company advises the men returned to work at the same wages, and under the same conditions ruling when they went out on strike.

EUROPE RECOVERING SLOWLY

George R. Woods Finds Conditions There at Present Difficult for American Trade

George R. Woods, American representative of R. S. Stokvis and Zonen, Inc., of Holland, whose New York office is at 17 Battery Place, has recently returned from a European trip during which he visited Holland, Belgium, France and England. In all of these countries he found that manufacturers are disirous of quickly seizing the chance to resume or enlarge their businesses and are thinking in nearly all cases of the future. Present conditions, however, present many difficulties which are retarding business in general in all of these countries.

Mr. Woods found in Holland that there is exceptional activity in shipbuilding, ranging from small yards, where 100-ft. and 200-ft. steel barges are being made up to new large shipyards, where 10,000-ton steamers are on the ways. Locomotive and railroad shops are exceedingly busy and manufacturing enterprises in general are active. There is a shortage of many things ranging from bicycles, motorcycles and automobiles to dwelling houses. Shipbuilding activities have lately been somewhat retarded by difficulties in getting steel, a good deal of which is being purchased from the United States.

Mr. Woods found the machine-tool situation in Holland somewhat adverse so far as American trade is concerned. Large quantities of German and Scandinavian machine tools were shipped to Holland during the war and these used tools are now being offered for sale at relatively low prices. As in other countries bordering on Germany, Holland is taking advantage of the low value of the German mark and large machine tools, particularly, are being bought freely in Germany. The American machine tools which sell best in Holland are those which are highly developed and made by well-established American firms with an international reputation.

The industrial leaders of Belgium, Mr. Woods says, are taking the same courageous attitude that the Belgian army took throughout the war. Nowhere did he find any depression or bewailing of present conditions, even though manufacturers realize that they will never become compensated for the losses caused by the Germans. Mr. Woods took photographs of quantities of machine tools which have been returned from Germany and most of these are in a condition which makes it almost impossible to use them again. Mr. Woods found that there was no reluctance to purchasing in Germany.

In fact, in one of the largest enterprises in Belgium, an official said to Mr. Woods that the low value of the German mark, the greater familiarity which the Belgian workman has with German material, the long American deliveries, the premium on the dollar and the high ocean freight rates all combine to force him to the conclusion that he will furnish his plant entirely with German equipment. "No one can visit a dozen or more plants in Belgium," says Mr. Woods, "without being amazed at the energy, resourcefulness and progressive attitude of the managers and executives in each plant. Belgium has made up her mind to reestablish herself quickly and in better shape than ever before and is now carrying out her resolution."

Ladle Cars Returned from Germany to La Providence Works

A Sign of Work Resumed

In France, Mr. Woods says that an observer is apt to conclude that France's problem is more complex than that of Belgium and possibly than that of England. The readjustment of the national economic program seems to be in the air. Throughout France Mr. Woods found evidence of the industrial disturbance caused by the war. The transportation problem is probably the most serious. Not only is there a shortage of railroad equipment but all seems out of balance. A tremendous amount of war material is still clogging the ports. For example, at Havre some of the largest piers are still filled with army stores and machine tools. General cargo is often unloaded from the ship's side to lighters, and these lighters are then towed around the harbor and up the Seine until some vacant place is found where the cases are unloaded, often to remain there for months. In several cases he found brand-new, expensive American machines hope-

How La Providence Works Looked After the Germans Were Through With Them

lessly covered with rust, the cases having been smashed because of severe handling and the outdoor storage did the rest.

In the machine tool trade in France Mr. Woods found a disposition to purchase everything possible in Germany and as little as possible in England and the United States. A speech recommending purchases in Germany in the French Chamber of Deputies was applauded. The speaker appealed to the business men of France not to let their prejudices interfere with their business judgment and urged them to purchase everything possible in Germany because of the low value of the German mark. There is considerable dealing in second-hand machine tools in France.

Mr. Woods found ample evidence of the seriousness of industrial life in Great Britain and at the same time he found that strenuous efforts are being made to rebuild that country industrially. As he puts it, "They are trying to build a new house and live in it at the same time." He found that it is proposed there to prevent importation of precision instruments such as micrometers, etc., claiming that England should not depend on other countries for tools which were needed for the national defense.

Mr. Woods summarizes his impressions of European conditions as follows: "The impatient attitude of European buyers and their apparent unreasonable demands can possibly be better understood if one considers France, Belgium and England as countries where every industry and every business has experienced a fire or an earthquake. Practically every organization is upset and disorganized and in this position, with strikes of all kinds pending from week to week, the business men of Europe are trying to rebuild their organization. Nowhere do you find conditions normal and it is in a disturbed, unsettled and abnormal atmosphere such as this that the agent of the American exporter is endeavoring to sell American products. As the price of the German tools descend, the greater is the possible number of buyers for those tools, but one gratifying fact is that even if German tools were given away there are many firms in Europe who would still buy American machine tools and when European buyers display confidence of this nature in American tools, it is a sign of encouragement that warrants American manufacturers in bearing with their European customers in this, the most trying period of European history."

Taylor Society to Hold Annual Meeting

The Taylor Society, organized to promote the science of management, will hold its annual meeting in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, Dec. 5 and 6. The first afternoon will be devoted to meetings of committees, followed at 6.30 p. m. by a dinner in the private dining room of Keene's Chop House, 72 West Thirty-sixth Street, where will be held the annual business meeting at 8.15 p. m.

The sessions of the second day will be open to the public. The forenoon session will start at 9.30 a. m. in Assembly Room No. 1, on the fifth floor. The topics and speakers will be: "Standards: Their Nature, Purpose, Necessity," H. K. Hathaway, consulting engineer in management, Philadelphia; "The Foreman," Sanford E. Thompson, Thompson & Lichtner Co., consulting engineer in management, Boston. The afternoon session starts at 2.30 p. m., and the following program will be presented: "A Labor Turnover Formula," Carl G. Barth, consulting engineer in management, Buffalo; "Mutual Rating: A Contribution to the Technique of Participation," Henry W. Shelton, consulting engineer in management, Philadelphia; "The Need of Better Management in Mining Operation," Hugh Archbald, mining engineer, Scranton, Pa.

The last session begins at 8.15 p. m., the subject being "The National Industrial Conference of October, 1919," and the speakers, Henry S. Dennison, Dennison Mfg. Co., Framingham, Mass., and Ida M. Tarbell, investigator and author, New York, both having been delegates representing the public at this conference. Further information may be secured from Dr. H. S. Person, managing director, room 710, 29 West Thirty-ninth Street, New York.

Foundry Equipment Export Corporation

The Foundry Equipment Export Corporation of New York has filed its articles of incorporation with the Federal Trade Commission, under the Webb law. It has a capital stock of $50,000 and its officers follow: T. S. Hammond, president; L. L. Munn, first vice-president; E. J. Woodison, second vice-president; V. E. Minnich, treasurer; S. T. Johnston, secretary. The directors follow: L. L. Munn, Arcade Mfg. Co., Freeport, Ill.; W. C. Norcross, American Molding Machine Co., Terre Haute, Ind.; R. S. Buch, Buch Foundry Equipment Co., York Pa.; George L. Grimes, Grimes Molding Machine Co., Detroit; S. T. Johnston, S. Obermayer Co., Chicago; V. E. Minnich, American Foundry Equipment Co., New York; T. S. Hammond, Whiting Foundry Equipment Co., Harvey, Ill.; E. J. Woodison, E. J. Woodison Co., Detroit.

Will Hold Triple Convention

A triple convention will be held May 17, 18, 19, 1920, at Atlantic City, when the American Supply and Machinery Manufacturers' Association, the Southern Supply and Machinery Dealers' Association and the National Supply and Machinery Dealers' Association meet at the Marlborough-Blenheim. Special rates have been offered by the hotel for this convention.

PEACETIME PROGRAM

Annual Report of Chief of Ordnance—Achievements of Mobile Repair Shops

WASHINGTON, Dec. 2.—The peacetime program of the Ordnance Department is revealed by the annual report of Major General C. C. Williams, Chief of Ordnance, which has just been made public. The outstanding feature of this program is the fact that the Watervliet arsenal has been designated as the developing center for the cannon industry. Certain other ordnance plants now Government owned, says the report, are to be held in ordinary and maintained in such condition as to reach maximum production in least possible time, the arsenal being operated on least number of guns necessary to develop improved processes, eliminate manufacturing errors, and provide facilities by using the same jigs, fixtures, special tools, etc., as are required for large-scale production at all Government plants. New and improved machine tools have been selected from dismantled ordnance plants, and stored against possible emergency.

The report cites the difficulties which had hampered cannon production before our entry into the war. Chief of these was the lack of proper machine tools. Beginning in March, 1917, however, the program of the installation of up-to-date machine tools was inaugurated. This reduced the cost of production in every arsenal.

The Artillery Division of the Ordnance Department has continued its activities in working out new designs. Some of the features promise to be most important in future warfare.

At the Watertown Arsenal a school has been established to give student officers practical instruction in metallurgy, heat treatment, testing, power, shop management, Ordnance Department administration, and work in the various shops. Original research work has been done at this arsenal into the effect of hydrogen and nitrogen on steel at different temperatures and the determining of occluded gases in cast and forged steels.

The work of the Ordnance Department during the war is summed up in the following conclusions of General Williams' report: "At the cessation of hostilities the Ordnance Department, American Expeditionary Forces, had provided, among other things in France, over 4000 cannon and 10,000 rounds of artillery ammunition through our depots; 93,326 machine guns, 75,000 automatic rifles, and 600,000 service rifles, besides those brought over by the troops who came fully equipped; 1,182,000,000 rifle cartridges, over 300,000,000 8-mm. cartridges, and 176,000,000 pistol cartridges. Including ammunition received directly from the French in the army area 6,128,635 rounds of 75-mm. had been actually expended and 1,705,000 rounds of heavier caliber (chiefly 155-mm. and 8-in. and 9.2-in. howitzer), as well as 809,929 trench-mortar bombs and 695,670,451 machine-gun and small-arms cartridges. Nearly 8400 special motor vehicles (tractors, trucks, reconnaissance cars, etc.) had been furnished for military use. The shops and depots of the department were adequate for any demands that could be foreseen or conjectured. Given the men it could meet any conditions that could arise."

Among the more interesting achievements in the individual factors of the Ordnance Department, General Williams records the work of the mobile ordnance repair shops with the A. E. F. Twenty-five of these were operating with the armies at the time of the cessation of hostilities. Concerning these General Williams says:

"The mobile repair shops were one of America's most important contributions to the problem of adequately and quickly repairing material so as to keep it in action, and in many cases carrying out repair work which the French did not attempt to do in the fields. An idea of their accomplishment is best given by a few specific examples. The second mobile ordnance repair shops on the Soissons front put into action against the retreating Germans 28 pieces of their own artillery, ranging from 77 mm. to 210 mm. An American division, located very far forward on one flank, had been abandoned, but the cannoneers remained at their guns until the French infantry, which had been holding their lines in the front, had passed behind them to the rear. They then removed the connection between each gun and its recoil cylinder and fired a round, permitting the gun to recoil completely off its carriage and thus doing sufficient damage to prevent its immediate use. This material was recaptured by the division two or three days later. It was turned over to the division mobile ordnance repair shop, which within a few days made the necessary repairs and restored the guns and mounts to serviceable condition. The mobile ordnance repair shops attached to the Thirty-fifth Division established a reputation of having no piece in the artillery out of action over five minutes during the Argonne drive. Guns and recoils were replaced on carriages during action, and the removal of shells stuck in guns was a regular function in which various ingenious methods were employed. Other jobs performed were furnishing of tools for the 75-mm. and the 155-mm. howitzers, supposed to be furnished by the French, but not available, the manufacture of special tools for artillery work, the repairs of water carts, rolling kitchens, bicycles, typewriters, shower baths, watches, meat grinders, steam rollers, stone crushers, trench pumps, the repair and operation of captured German baths, and delousing plants, and the handling of salvage work at the front."

As in the annual report a year ago, this one again emphasizes the great work which was done by American manufacturers during the war.

"With the loyal help from every representative business in the United States," says the report, "the mobilization of American industry was accomplished, and on Nov. 11, 1918, more than 3,500,000 workers were doing their best directly or indirectly to furnish ordnance material for the army overseas, an army in itself nearly twice as large as the United States command on all the fighting fronts." O. F. S.

French Companies Taking Over German Iron and Steel Works in Lorraine

As already mentioned in correspondence from France to THE IRON AGE arrangements have been consummated in the past month for the taking over of the iron and steel works, formerly operated by German companies, by syndicates of French banking and iron and steel interests. The French Government has been in control of these Lorraine plants, some of which have been operated in part while others have been closed down in recent months. The French Government is now selling the properties, and the purchase prices will be credited on the German indemnity debt to France. Theoretically the individual German owners of these iron and steel properties, as in the case of the Saar Valley coal mines which France takes over, are to be reimbursed by their own Government. Practically, however, the German owners lose their investments since there is no human probability of the German Government being able to repay these losses.

Recent transactions in the sale of German works in Lorraine to French interests include the transfer of the Thyssen works to a French group for 150,000,000 francs, the Lorraine Iron & Mining Works to the Participation Minière et Métallurgique for 110,000,000 francs and the Rombach iron works to the Société d'Etudes et d'Entreprises Industrielles d'Alsace-Lorraine for 110,000,000 francs.

Reduced Output in Alabama

BIRMINGHAM, ALA., Dec. 1.—About 75 per cent of the Alabama coal miners were at work to-day compared with 90 per cent at the close of last week. Operators believe normal output will be again attained before the close of the week. Union leaders predict decrease in output. Operators are more likely to prove correct. The new Garfield wage scale went into effect to-day.

New Basis in the French Metal Trades

Effect of the Eight-Hour Day and Higher Wages on the Automobile Industry—Minimum Wage and Premiums—Welfare Work

BY W. F. BRADLEY

PARIS, FRANCE, Nov. 1.—During the past five years more changes have taken place in rates of pay and general working conditions in the French automobile industry than in any previous period of its existence. I have selected that industry as an outstanding one and as representing the changed conditions now obtaining in the metal-working trades of this country.

Until the outbreak of war the working hours in practically all French trades were 10 daily and 60 weekly. Overtime was not always paid at an increased rate. These conditions had been in existence for years and seemed to be as established as anything on this earth can be.

There was a movement for what is known as the English week, or, in other words, for a Saturday afternoon holiday, and although this had been granted by a small number of firms it did not decrease the weekly working hours. In order to gain five hours on Saturday, the men worked an extra hour on each of the five full working days of the week. Under this 60-hr.-a-week system work generally began at 7 a. m. and finished at 6.30 p. m., for it was the usual plan to have at least an hour and a half for the midday meal.

With such a long working day men were obliged to live in close proximity to the factories; if they were so far away as to be unable to return to their homes at midday, they were absent at least from soon after 6 in the morning to 7 or later in the evening six days out of seven. For four months of the year they saw their homes in daylight only one day a week.

Revolutionary Changes

In less than five years this condition has been changed so completely that the working hours now are only 48 per week, and in many cases men who in 1914 were absent from their homes for 12 to 13 consecutive hours, now leave home at 6.30 in the morning and are back again before 4 o'clock in the afternoon. This has been brought out by abandoning the established French habit of eating a heavy meal at midday.

A decrease had been made of 20 per cent in the number of working hours of the French mechanic. This decrease had not been made gradually but was put into effect at one stroke, and was given to the men who had never previously known any reduction in the working hours. In reality the reduction was greater than 20 per cent, for during the stress of war the working hours had generally been increased to 66 per week. This increase was in effect during 1915 and 1916, and though it officially went out of effect, many workers continued it.

Factory Betterment and Higher Wages

While working hours have decreased, working conditions have been ameliorated, in very large numbers of cases, almost beyond recognition. The change here is not uniform, for while some factories have been rebuilt until they are the equal, from the standpoint of comfort to the worker, of the best in the world, others have grown under the force of necessity and within artificial limits which have left no room for the workers' betterment. These conditions apply to the smaller shops, which, however, will be obliged to follow the general tendency toward betterment.

In addition to these changes, wages have increased. In 1914 a good skilled mechanic in the French automobile industry was satisfied with 25 cents, or $12 a week of 60 hr. Here and there a man was found who was paid a cent or two an hour more than his companions, but at the same time there were a certain number who, owing to slight inferiority, or a tighter policy on the part of the employers, did not reach the standard of 25 cents an hour. Unskilled workers were paid from 10 to 11 cents an hour.

By the middle of 1918 wages had increased to 50 cents, or $30 a week for a 60-hr. week, and in June, 1919, the skilled mechanics of France were earning the same wage for 48 hours work, and in consequence were being paid at the rate of 63 cents an hour. During the same period unskilled workers had jumped from 10 cents an hour to 22 cents in 1918, and to 27 cents an hour in June, 1919.

In addition to this, unskilled workers were entitled to an indemnity of 50 cents a day to cover high cost of living, so that, when the war came to a close, a laborer in the French automobile factories was receiving $16.20 a week, compared with the wage of $12 a week for a highly skilled mechanic before the war.

Minimum Wage and Premiums

It has been contrary to the policy of French employers of labor to pay a standard rate whatever the ability of the man. The system is not uniform throughout the factories and is somewhat complicated. Stripped of non-essentials, however, it really amounts to a recognized minimum rate for each class of worker, with a premium according to ability, this premium bringing the total wage to a recognized maximum for that particular class.

The practical result of this is that it enables the employer to encourage merit and energy and it allows some economies to be effected if there is a stoppage for any cause outside the control of the worker. For instance, if, owing to an accident or the lack of power the men have to stop work in the middle of the morning, they would only be paid at the minimum rate for the lost time and not the minimum plus the premium.

Again, a worker may receive 40 cents an hour fixed, plus 10 cents premium, giving a total of 50 cents an hour, or $4 a day, this being above the minimum, but below the maximum. A thoroughly competent worker might receive 52 cents an hour fixed and 11 cents premium, giving him the total of 63 cents an hour, which is the maximum rate. When the total wage is only $2 a day the worker is entitled to a $1 indemnity for high cost of living, giving him a minimum wage of $3. This indemnity for high cost of living is on a decreasing scale, beginning at $1 when the daily wage is $2 and ending at 0 when the daily wage is $5.

Women in Industry

Much more has been heard of woman's part in the war in England than in France. The reason is not far to seek. In England there are immense numbers of young women who before the war had no occupation. These girls volunteered for service and the change was of such social importance as to attract an immense amount of attention. In France, the great majority of women of the working and middle classes worked before their marriage and in many cases after it; thus in their case the war only brought about a change of occupation. Thousands of the mechanics' wives, with their husbands at the front, went to work in the factories. Girls who had been employed in the millinery, dressmaking and fancy trades, left these occupations for munition and engineering shops.

In the automobile factories there were very few jobs women did not undertake. Although the majority were kept on the lighter classes of works, they were even found in the forge shops and the foundry. Renault trained groups of women for aviation engine assembly, which they did very satisfactorily. He also

had women chauffeurs for driving small automobile trucks from one factory building to the other. Darracq used women very successfully for acetylene welding. Unic used women for chassis testing on the road.

Provisions for Children

The presence of large numbers of married women in the factories brought about important changes. On the request of the Government all the large factories opened nurseries, and in some cases maternity homes, for the benefit of the married women working in their establishments. Citroen erected one of the finest maternity homes, nurseries and infants' schools to be found anywhere in the world. Renault, Panhard, and other big establishments did the same. At the Renault factory, which may be taken as a sample of the others, children were admitted between the ages of 3 and 10. They were brought by their mothers at 6.30 in the morning, before beginning work.

From 7 to 7.30 they were given breakfast, and at 8 o'clock all children above 6 years of age were taken to a public school in the neighborhood and called for at 11 o'clock. At midday a hot meal, brought in the morning by the parents, was served to the children. The afternoon was taken up with school for the elder children, followed by a light meal, then recreation or study until the mothers called for their youngsters at the end of the day. All this was free, and was carried out under the best possible conditions, with the attendance of a doctor and a trained personnel.

Before the war medical and dental services were very slight. Even the best factories had nothing more than a first aid dispensary for dealing with accidents. All this has changed and such firms as Renault and Citroen have the best surgical and dental services modern science can devise. The records show that at the Renault plant in 1918 there were 11,770 medical consultations, 80,337 persons had wounds dressed, while in the dental department 5239 teeth were extracted and 4676 persons received other dental treatment.

Food Canteens

One of the greatest problems was that of food. Owing to rapid growth of the industry, thousands of workers had to come a considerable distance to the factories, and many of these people were refugees from the invaded regions who possessed nothing more than a furnished room. It was soon realized that in order to meet the requirements of these people and to combat the increasing cost of living efforts would have to be made to provide food in or near the factory at reasonable prices.

Practically all the automobile factories opened canteens in which a midday meal was served and also hot meals for the night shifts.

Lorraine-Dietrich, for instance, erected a canteen which was open day and night. Hot meals were served at midday, 7 p. m. and midnight. A meal consisting of soup, meat and vegetables, cheese and dessert, cost 25 cents, but this price was later increased to 37 cents. Wine and coffee were extras, the latter being supplied at 2 cents a cup. Women had a special canteen with ovens capable of warming 200 meals at a time. Since the war the all-night service has been discontinued, but in place of the temporary canteen a modern club house is being erected for the benefit of Lorraine-Dietrich workers.

At present the number of workers is much less than during the war, but meals are being continued at popular prices. Every morning an automobile truck is sent to the central markets in Paris to buy meat, vegetables, and other food at wholesale prices. A scheme is being completed whereby the factory workers will maintain their own poultry farm, have a vegetable garden and keep pigs. This is being done in co-operation with the factory management in order to combat profiteering.

Social Work

Citroen seems to have realized more than any other motor manufacturer the value of a social worker among his factory hands. During the war he erected a dining hall in which 3500 workers sat down to a hot meal at one serving. Everything was up to date; the meals brought from the kitchens on electric trucks driven by women and placed on heated counters, from which they were served by waitresses. The dishes were cleared away in a similar manner first from the tables to the counters and then from the counters to the kitchens by means of electric trucks.

A band played during the meal, and at very frequent intervals guests were invited to eat with the work people. Thus, soon after the Chateau-Thierry battle, several hundred American soldiers, who had taken part in this fight, were invited to lunch with the Citroen workers. There were two doughboys to each table of French workmen or women. The officers ate on a balcony with the factory management and an American army band joined forces with the French civilian group of musicians.

Even in the most important cases the welfare work is not so important as in American factories. The growth, however, has been enormously rapid, and the movement is bound to spread, for, wages being equal, workers will naturally migrate to those firms where conditions are highest.

Already the standard set by such people as Renault, Citroen and Lemoine, where are to be found clubs, sporting, musical and literary associations, co-operative societies, etc., is very high. The average French automobile factory is 100 per cent cleaner, brighter and more comfortable to work in than it was before the war. It is the exception, rather than the rule, for the employer to consider that his duty finishes with the payment of a stipulated wage for a stipulated amount of labor. In the generality of cases employers realize that their responsibility is involved in the 8-hr. day and that it is incumbent on them to assist their workers to obtain the greatest possible benefits from the leisure given them.

The Eight-Hour Day

Opinions regarding the results of the 8-hr. day vary, although on the whole factory owners are dissatisfied. From a social standpoint, the time probably was ripe for the application of this law, but it could not have been applied at a more inopportune moment for the factory heads. When this law went into effect the factories were in a transition stage from war to peace conditions. Certainly 50 per cent of the machinery was standing idle, while the drawing office, the toolroom, the experimental department, were working at full pressure in order to prepare for new production. In all these departments the loss of 12 hours a week was a dead loss and meant so much delay in getting into production.

When the law was voted, it was claimed that as the efficiency of workers decreased with the length of the day, the drop from 10 to 8 would not entail a loss of 20 per cent. The two most inefficient hours were to be eliminated, workers were to agree to avoid waste moments, and owners were to adopt more up-to-date methods and machinery. In view of the transition period, it has been impossible to make many changes in plant or methods, and this undoubtedly accounts in a large measure for the general dissatisfaction of employers.

Better Than an Eight-Hour Output

At the Gnome factory, where Laurent Seguin put the 8-hr. day into effect before it had been enforced by law, and where the experiment was first made of working 8 hr. with a break of only half an hour for a light meal in the factory, general satisfaction is expressed with the working of the scheme.

Instead of allowing a margin of 10 minutes after the ringing of the factory bell and tolerating another 5 or 10 minutes to get into working clothes, it is insisted on men being at their machines on the stroke of the clock. Idling during the day has been eliminated, and work is carried on at full pressure until the factory bell rings. By straight talks between factory management and workers the latter have been made

to see the necessity of avoiding waste and maintaining output as high as possible.

At the Delage factory, Engineer Michelat is of the opinion that the loss is not in the ratio of 10 to 8. In this particular case the 8-hr. day was adopted two weeks before it became law and the obligations which it entailed were fully explained to the workers. Consequently a start was made under good conditions and, helped by the fact that all the heads of departments were men who had been in the service of the company from the beginning, there were present all the elements necessary for the success of the movement. The Delage engineers calculate that the loss is about 1½ hr. a day, but that as production increases this may be reduced to one hour. It is not contemplated that at any time the output will be the same for 8 hr. as for 10.

Table 1.—Wages in the French Automobile Industry.

	60 Hours per Week	66 Hours per Week	66 Hours per Week	66 Hours per Week	66 Hours per Week	60 Hours per Week	60 Hours per Week	60 Hours per Week	48 Hours per Week
Skilled workers: fitters, turners, etc.	1914 25c per hour	March, 1916 26c per hour	July, 1916 30c per hour	January, 1917 36c per hour		May, 1917 40c per hour	April, 1918 45c per hour	August, 1918 50c per hour	June, 1919 63c per hour
Unskilled workers	10 to 11c	December, 1914 12c per hour	September, 1915 13c per hour	January, 1916 14c per hour	July, 1916 16c per hour	February, 1917 18c per hour	April,* 1917 20c per hour	April,† 1918 22c per hour	June, 1919 27c per hour

*From this date unskilled workers were given an indemnity of 30c per day to cover high cost of living.
†In June, 1918, indemnity increased to 50c per day.

A Dead Loss

Owen Clegg, chief engineer and director of the Darracq Co., shares the opinion with the heads of many other French concerns that the 8-hr. day entails a dead loss of 2 hr. a day, and that this lost time cannot be recovered. He says:

"Workmen are producing no more per hour than they did during the war; if anything, they are producing less, for during the war we were working at high pressure, and since the armistice there has been a general tendency toward relaxation. It is mere foolishness to imagine that any body of men will produce as much work in 8 hr. as in 10."

Clegg is not alone in this point of view. Scores of motor manufacturers can be found ready to testify that the 8-hr. day was premature and uncalled for. Proof of this is found in the fact that many mechanics, after leaving the factory, find extra work elsewhere. Naturally industrious, having no hobbies, and used to working 10 to 12 hr. a day, the French mechanic who knocks off at 3.30 in the afternoon finds time hanging heavily on his hands and finishes by finding extra work in one of the many small mechanics' shops in his neighborhood. This undoubtedly is a temporary condition, and will be eliminated when men learn how intelligently to employ their leisure time.

Table 2.—Minimum Standard Wages in French Automobile Industry

	Per hour	Per day
Unskilled workers, men	$0.25	$2.00
Unskilled workers, women	.19	1.50
Specialized laborers, men	.29	2.30
General Mechanics (skilled specialists):		
Adjusters	.35	2.80
Adjusters, tracers	.37	3.00
Turners	.36	2.90
Milling hands	.35	2.80
Grinding machine operators	.35	2.80
Planing machine operators	.35	2.80
Gear-cutting machine operators	.35	2.80
Pattern makers	.45	3.60
Automatic machine operators	.35	2.80
Polishers	.37	3.00
Toolroom Hands:		
Adjusters	.44	3.50
Turners	.45	3.60
Milling machine operators	.44	3.50
Smiths	.40	3.20
Grinding machine operators	.44	3.50
Sheet Metal Shops:		
Sheet metal workers	.35	2.80
Toolmakers	.39	3.10
Planers	.37	3.00
Foundry:		
Molders	.35	2.80
Aluminum and copper foundry hands	.51	2.50
Body Work and Aviation:		
Band saw operators	.42	3.40
Circular saw operators	.37	3.00
Planing and other machine operators	.35	2.80
Wood turners	.35	2.80
Smiths	.36	2.90
Joiners	.35	2.80
Carpenters	.35	2.80
Varnishers	.32	2.60
Painters (specialists)	.35	2.80
Saddlers	.35	2.80
Propeller makers	.42	3.40

Indemnities for high cost of living are allowed on above wages. For men earning $2 to $5 the indemnity is from $1 to 0 per day. For women earning $1.50 to $3.60 the indemnity is from 60c. to 0 per day. Workers under 18 years of age are entitled to an indemnity of 20c. per day, the maximum wage from all sources being $2.70 per day.

Women's Objection to Eight-Hour Day

In other cases the objection against the 8-hr. day comes from the wives of working men. These women claim that the men have now too much time on their hands and that they either spend it foolishly or injuriously in the wine shops. Here again it is a case of education, in which the employer will have to take his share.

Another objection brought against the 8-hr. day is that it already has entailed the adoption of two shifts where one was sufficient formerly. This is the case at the Goodrich tire factory and also at the De Dion Bouton automobile factory for the automatic machinery. During the war machinery was naturally not being run below its capacity, and now that hours have been reduced the only way to obtain the necessary production is to employ two shifts.

There is a general opinion that the technical value of the French workman has decreased during the war. Four years of intensive production have had a deteriorating influence. M. Michelat, of the Delage Co., says:

"Before the war it was considered an honor for any man to be selected for the experimental, test and racing departments, and these positions were eagerly sought for, quite independently of any increase of wages they brought. Every really good mechanic was proud to be selected for a job requiring more than ordinary skill, and there always was keen competition for such jobs. Now the men do not care; they are just as willing to do fast repetition work as to be picked out for some highly skilled job."

The Booth Electric Furnace Co., Chicago, the incorporation of which was recently announced, has opened district sales offices at New York, Philadelphia and Cleveland. Edward B. Stott & Co., Flatiron Building, New York, with E. F. Tweedy, secretary of that company directly in charge, will handle sales in New York and New England. Representation in eastern Pennsylvania, New Jersey, Maryland, Delaware and the southern Atlantic states, will be by the Northern Engineering Co., 308 Chestnut Street, Philadelphia, with F. W. Doran in charge. Charles L. Foster, formerly sales manager, Electric Furnace Co., Alliance, Ohio, will represent the Booth company in northeastern Ohio, western Pennsylvania and western New York State, with offices at 879 The Arcade, Cleveland.

ESTABLISHED 1855

THE IRON AGE

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The War After the War

A great deal was written, while the armies were fighting in Europe, of the war that was to come after the great war. Uppermost in all the war-time speculation as to international trade conditions after the making of peace was the idea of economic boycotts or other forms of discrimination against quondam enemy countries. That sort of war has not come. It is a fact that nearly every nation that had an important part in the great conflict has had war on its hands in plenty in the past year, but it has not been with an outside power. The conflicts have been between classes in the same country or between the government and a class. Great Britain had its railroad war, and avoided a coal war by surrender to the miners. The United States has had the threat of a railroad war and actually has a coal war, saying nothing of incipient wars with enemies of the Government, who would overturn it if they could. There is more conflict in the domestic news of today than was known in any previous peace-time in our history.

The steel industry has been involved in its own labor war for ten weeks and is now a noncombatant sufferer from the coal war, which, if long continued, will bring loss to every industry in the country and physical suffering to hundreds of thousands of men, women and children. The coal mine workers, as winter comes on, serve notice that the country can choose between granting their demands and freezing.

It is hard to believe that the people of the United States, who came so magnificently to the help of the world last year, when they suppressed their differences and showed how strong they could be, united, are now so rent by differences. Most serious as an index of the time that will be required for setting things at rights is the conspicuous lack of good will between employer and employee in so many industrial operations.

It may be well that the country is having all these troubles at once. Some regrets have been expressed that contests between employers and employees could not have been separated from the issues that have arrayed various types of revolutionaries against the Government. But there is a closer relation between the two kinds of conflict, as the lines have been drawn, than some special pleaders for present-day unionism want to admit. That is why the militant policy rather than the policy of conciliation must control the handling of some of the labor disputes that are now costing industry so dear a price. The American people are seeing more plainly than they ever saw before that the war necessities of the nation were taken advantage of to fasten upon it a rule of labor union leaders that was intended to be the actual setting up of an *imperium in imperio*—a government higher than the Government under the constitution. That is the naked issue that is being fought out now, and it is better realized with every day that any compromise of that issue would be simply a postponement of trouble and the most serious mistake that could be made. Peace, when it comes, must be a peace of right, and there are signs that the American people are willing to fight it out on that line if it takes all winter.

Conditions in the Foundries

The recent advance of about $6 per ton in the prices of foundry and basic pig irons is attributed to a large extent to the scarcity of pig iron due to the steel and coal strikes; but this fact should not be allowed to obscure the activity of many foundries, which has been an important factor in the recent situation. The strikes have curtailed production materially and have not interfered with the consumption of pig iron except, perhaps, in a few plants where iron has not been received as promptly as desired. But it is doubtful whether any difficulty would have been experienced in selling all the pig iron produced if there had been no strikes, although it seems certain that the price advance would not have been so rapid, and there might have been no higher prices for delivery in the remainder of this year. A few weeks ago there was a general disposition among pig iron producers to hold prices at the levels then prevailing, but this policy was abandoned when the pressure from consumers to place orders became strong and some producers began to advance their quotations.

Special inquiry as to conditions in central and

western territory shows that gray iron foundries are operating in the Chicago district at 100 per cent of capacity except in cases where there is a shortage of labor. The demand for castings exceeds the productive capacity of the foundries and many prospective orders are going begging. For example, an effort to place a contract for 10,000 gas engine parts has not been successful. Early in the summer the malleable foundries which served the railroads were operating at a low rate, while those serving the automobile business were running at full capacity. Since that time, expansion of the automobile industry and a growing demand by the agricultural implement industry have taken up the slack with the result that all malleable plants in the Chicago district are now turning away work.

In the Cleveland district, gray iron and malleable foundries are operating at about 80 per cent of capacity, and the Michigan district is running at nearly full capacity. Many Central Western foundries have never got back to their normal supply of molders since the war, as a large number of men who left the foundries to go into the service entered other lines of employment after returning from the war. To this is generally attributed the fact that the Cleveland foundries are running at only 80 per cent of capacity. The situation with respect to steel foundries is somewhat different, and we are informed that the Cleveland steel foundries are operating at 50 per cent of capacity. Owing to the limited buying of the railroads and to a lesser extent to decreased buying for steel plant work, they have not been busy and probably will not be until the policy of the railroads is more clearly defined.

On the whole, the outlook for gray iron foundries is favorable while that for the steel castings business is enveloped in considerable doubt.

Blast Furnace Raw Materials

While the official statistics of pig iron production in 1918 were made public early this year, the statistics of raw materials consumed by blast furnaces reached the public through the annual statistical report of the American Iron and Steel Institute, issued in October. It appears that the average consumption of coke per ton of pig iron produced did not increase during the war as much on an average as would be suggested by the extreme cases that were cited. It is notable also that in a period of ten years covered by the statistics, the average consumption of iron ore and other ferrous material, per ton of iron made, has not increased despite the lower grade Lake Superior ores now being used.

The amount of material that must be fluxed off is well shown by fuel and limestone consumption. Fuel statistics are available from the year 1912, iron ore statistics from the year 1909, and limestone statistics for many years. Limestone consumption by all furnaces except charcoal, and the consumption of coke and raw bituminous coal by the coke furnaces are given in the accompanying table, in pounds per ton of pig iron made.

	Limestone Pounds	Coke Pounds		Limestone Pounds	Coke Pounds
1909	1190.5	.....	1914	1119.6	2254.4
1910	1204.0	.....	1915	1116.3	2252.0
1911	1153.6	.....	1916	1049.2	2285.3
1912	1146.1	2436.5	1917	1086.6	2339.7
1913	1170.5	2433.3	1918	1043.8	2375.2

There is disclosed a very decided decrease in the average amount of limestone consumed, except for a very slight rise in 1917, and 1918 shows the lowest limestone consumption of all. In coke, after a continued decrease through 1915, there was an increase in the war years, but not sufficient to make the consumption as great as it was prior to 1914.

The decrease in the average content of Lake Superior ores is a well established fact, and decreases in limestone and coke consumption mean that that condition has been more than met. Several influences have been in operation. In the first place, while the Lake Superior ores as shipped have been leaner and leaner on the whole, they have represented an increasing proportion of the total amount of ore used, because ore production in the United States outside the Lake Superior region has been practically stationary for about 13 years. The production outside the Lake Superior region was 9,873,357 tons in 1906 and 9,878,484 tons last year. Meanwhile there were divergences in both directions. The use of imported ore, however, has exercised a slight counterbalancing influence, these ores being rich and having come in at the rate of slightly over 2,000,000 tons a year in 1909-10-11, but at the rate of only slightly over 1,000,000 tons in 1916-17-18.

The statistics of ferrous material charged to blast furnaces begin with 1909. There is no separation as to classes of furnaces, but as nearly all the pig iron has been made by coke furnaces the showing is applicable to such furnaces with sufficient closeness. Consumption is stated separately of ore, briquettes, sinter, etc., and of scrap, mill cinder and scale. The total of the two classes has shown no general change in the ten years, being 1.984 tons per ton of pig iron in 1909 and 1.983 tons in 1918. The maximum was 2.018 tons in 1911 and the minimum 1.968 tons in 1916. There was a slight increase in the proportion of scrap, etc., which comprised 5.0 per cent of the charge in 1909 and 6.6 per cent in 1918. This slight increase, however, would counterbalance but little decrease in the iron content of the ore.

In the circumstances, the natural conclusion is that blast furnace practice has improved, whereby there are smaller losses of iron in slag. The decrease in limestone consumption is to be attributed in considerable part to decreased coke consumption whereby there is less ash to be carried off, while decreased coke consumption is necessarily attributable to better furnace practice and better coke, apart from the special aggravations of 1917 and 1918. The decrease in coke consumption is certainly attributable in part to the increase in by-product coke. In 1909 about one-sixth of the coke used in blast furnaces was by-product, while in 1918 the proportion was fully one-half.

Ferromanganese Imports

Recent developments in the manganese situation are favorable to the American industry. Although domestic production is now but little more than 50

per cent of what it was during the war—15,000 tons per month, against 28,700 tons per month in 1918, as given in detail in other pages—it is 50 per cent larger than in 1913. Of more importance is the condition of the British industry which before the war exported to the United States 50 per cent of the American consumption, or 10,600 tons per month in 1913, but is now sending only about 2000 tons per month. The explanation of the great decline is probably the fact that British manganese ore supplies are low, the statistics showing that imports thus far this year have been only 50 per cent of the rate before the war, while they are now considerably less than American imports. As a result, British producers are not competing at present for American business, and meanwhile American producers have advanced their prices. Predictions of still higher prices are being made.

Death of Henry Clay Frick

THE death of Henry Clay Frick, coming closely after the passing of Andrew Carnegie, with whom he had been long associated, takes away within a short time another of the men who laid the foundations of the present-day American steel industry. Mr. Frick died at his home in New York Tuesday morning, Dec. 2, following an attack of ptomaine poisoning, from which he had been suffering for nearly a month.

Mr. Frick was in no sense a public figure. Rarely has he appeared at important gatherings of business men. His attendance at the dinner of the American Iron and Steel Institute in New York, late in October, was remarked because it was almost without precedent. He was bold in his conception of business enterprise and decisive in acting upon a judgment he had formed. It was largely due to him that the Carnegie Steel Co. became an owner of Lake Superior iron mining property, Mr. Carnegie having for years opposed such acquisitions.

Although identified with the steel industry for several decades, it was in coke manufacture that Mr. Frick won his first business success and the beginning of his great fortune. He was born on Dec. 19, 1849, at West Overton, Pa., the son of John W. and Elizabeth Overholt Frick. His grandfather, Abraham Overholt, was one of the largest land owners in western Pennsylvania. Mr. Frick's early life was spent in the country, where he attended school, until at the age of 16 his natural bent for business manifested itself and he entered the office of his grandfather as bookkeeper. Prior to this he had worked for a short time as a clerk in a dry goods store.

In 1871 he organized a company, with two of his grandfather's friends as partners, to engage in the manufacture of bee-hive coke. He was raised in the Connellsville region, and although he knew little of the coke business, he was attracted by its possibilities, and with his savings gradually acquired 300 acres of coal lands. The firm of Frick & Co. started with 50 ovens, and this number was increased the next year to 200. Then the panic of 1873 came, and everybody but Mr. Frick apparently thought the business had come to an end. He interested some capitalists in his project, and not only bought out the interests of his partners but acquired other coke ovens in the district. His confidence was justified, for when the trouble had passed coke rose in price from 90 cents to $4 or $5 a ton, and the boom put young Frick at the head of the coke industry of the Connellsville region.

Among those who became interested with Mr. Frick was Thomas Mellon of Pittsburgh. In 1879 E. M. Ferguson of Pittsburgh purchased an interest; then Walton Ferguson was admitted to the firm, then called H. C. Frick & Co. The story is told that in 1882 Carnegie Bros. & Co. were in the market for coke, and finding that the Frick firm controlled the situation, they made Mr. Frick an offer for part of his holdings. Eventually the Carnegie interest held control in the Frick firm and Mr. Frick resigned from the presidency. He did not, however, relinquish his interest in either the Frick or Carnegie companies, and a few years later he was made chairman of Carnegie Bros. & Co.

It was at the time of the Homestead steel strike in 1892 that Mr. Frick came into greatest prominence. For years prior to that time new machinery had been introduced in the Homestead and other mills which greatly increased the output, but lessened the need for labor. The pay of the "tonnage men" was so greatly increased that the company insisted on a reduction in their rates of pay when it came time to negotiate a new scale. It also insisted that wages should slide down in case billets went below $25, which had long been the scale minimum even though the market price had gone considerably lower. The men refused to listen to the proposals and many fruitless conferences were held. A strike was ordered by the union officers. Mr. Frick imported Pinkerton detectives to protect the steel company's property, and they were entrapped on river barges and shot to death by the strikers. The National Guard of Pennsylvania was called out and put Homestead under martial law. While the excitement was at its height Alexander Berkman, an anarchist from New York, called at Mr. Frick's private office in Pittsburgh, shot him four times and stabbed him seven. Nevertheless, Mr. Frick recovered and Berkman was sent to the penitentiary for a long term of years and served his sentence. Berkman now is out of prison, but is facing deportation as an anarchist.

Through the eighteen-nineties Mr. Frick was the active head of the Carnegie Steel Co. Some differences grew up between him and Mr. Carnegie, of which details were given in the story of Mr. Carnegie's life which appeared in THE IRON AGE of Aug. 14, 1919. The basis of the coke contract of the Carnegie Steel Co. with the H. C. Frick Coke Co. was one of the causes of difference, another was a purchase of land by Mr. Frick, which previously he had tried without success to induce the Carnegie Steel Co. to buy for manufacturing purposes. The differences led to a suit over Mr. Frick's holdings in the Carnegie Steel Co., Mr. Carnegie having sought to have Mr. Frick's interest acquired by the company under the "Ironclad Agreement" into which the Carnegie partners entered. The suit was compromised by a plan to form the Carnegie Co., a New Jersey corporation with a capital stock

of $160,000,000, to acquire the stock of the Carnegie Steel Co. and the H. C. Frick Coke Co. Early in 1901 came the formation of the United States Steel Corporation, with its absorption of the Carnegie Co. Just previous to this Mr. Frick, the Moore Brothers and others had taken an option on Mr. Carnegie's holdings in the Carnegie Steel Co., but their effort to eliminate Mr. Carnegie and to form a combination of the Carnegie interests and the various Moore Brothers companies—National Steel Co. and others—did not succeed.

Mr. Frick became a director of the United States Steel Corporation and from the beginning was a member of its finance committee. For the past 18 years he has been a prominent figure in its councils. On coming to New York in 1901 he allied himself with E. H. Harriman and took a place on the directorate of the Union Pacific Railroad. He was a director also of many other corporations. At one time he was the largest holder of stock in the Pennsylvania Railroad.

On Dec. 15, 1881, Mr. Frick married Adelaide Howard Childs of Pittsburgh. Four children were born to them, of whom two, Helen Clay Frick and Childs Frick, survive.

Judge Gary's Tribute

Judge E. H. Gary, chairman United States Steel Corporation, made the following tribute to Mr. Frick:

In the financial and industrial world Henry Clay Frick was a conspicuous figure. His natural ability, wide experience, unfailing courage and fixed determination were universally recognized, and placed him in a position of high standing and great influence among the business men of this country and elsewhere.

While still a young man, without fortune and with but little assistance from others, he entered the domain of business activity and as the result of energy, perseverance and integrity of purpose he succeeded, prospered and became wealthy.

He was unusually generous in his benefactions, contributing hundreds of thousands, and even millions, for the benefit of others, although his liberality was little known. He disliked publicity and abhorred ostentation.

He was a student and lover of art, and by the use of patience and thought and large sums of money he formed one of the finest private collections of paintings, statuary, bronzes, porcelains, enamels, furniture and other objects of art in existence, all of which, under the provisions of his testament, will in due time be permanently turned over to the public use and enjoyment, together with his costly home in New York, adequately endowed.

Not intending to intrude within the confines of personal relations, it is believed permissible to refer to one patent characteristic. Mr. Frick seemed perfectly happy and contented when he was surrounded by his small grandchildren, of whom there were four.

Mr. Frick has taken a leading part in the affairs of the United States Steel Corporation during the last 17 years. Keen of perception, sound of judgment, expert in management, his voice was potential. He talked little, but he said much. All his associates on the finance committee, for whom I am making this statement, entertained toward Mr. Frick sentiments of respect, admiration and affectionate regard.

Coke Workers Get 14 Per Cent Advance

PITTSBURGH, Dec. 2.—The H. C. Frick Coke Co. and several of the larger independent coke producers have announced an average advance in wages of 14 per cent effective from Dec. 1 in the rate for mining. The scale effective to Nov. 30 was $2.29 per 100 bushels for rib and room coal. This advance of 14 per cent is in line with the advance announced by the Government as fair to the coal miners. It is likely all the coke producers will follow at once the action of the Frick Coke Co. and grant a similar advance.

Basing Point Hearing

WASHINGTON, Dec. 2.—A formidable array of legal talent began presentation of the Pittsburgh basing point controversy to the Federal Trade Commission today. It was agreed that each side was to have seven hours, but this is sure to be extended by the questions of the commission itself. The hearing will probably take all this week. If the commission decides that it has jurisdiction over the case, which it has not yet done, final decision is not expected before some time next year.

CONTENTS

French Engineers Honored

Honorary membership of the American Society of Mechanical Engineers was conferred upon two French engineers, at its meeting in New York, Dec. 2. One is Charles de Freminville, a member of the French economic mission to the United States and the engineer of the Schneider Works of France. The other is Auguste C. E. Rateau, of Paris, a pioneer investigator in the field of the steam turbine and the turbo-compressor.

A. M. Castle & Co., 715 North Morgan Street, Chicago, distributors of finished steel products, etc., have bought from Cyrus H. McCormick the northwest corner of Blackhawk Street and Cherry Avenue, 219 x 561 ft., containing about 122,000 sq. ft. abutting on the Chicago River and served with a Chicago, Milwaukee & St. Paul Railway switch. The east half of the property contains two 7-story, two 3-story, two 2-story and two 1-story buildings, under lease to the Union Wire Mattress Co. The purchaser, whose main warehouse is one block south, will erect a warehouse building with a floor area of about 200,000 sq. ft. on the vacant 110,000 sq. ft., as a further unitl to their adjacent property.

LARGER PIG-IRON OUTPUT

A Gain of Over 500,000 Gross Tons in November

Active Furnaces Dec. 1, Total 251 of 84,550 Tons Daily Capacity—Ferroalloy Output Maintained

The production of pig iron in November amounted to 2,392,350 gross tons, or 79,745 tons daily, as compared with 1,863,558 tons or 60,115 tons daily in October, or an increase of 32.7 per cent. Forty-five furnaces were blown in during the month, and only seven blown out. Marked recovery was made in the Chicago district and in Ohio. Active furnaces Dec. 1 totaled 251 with an estimated capacity of 84,550 gross tons a day as compared with 213 furnaces of 65,625 tons a day capacity in blast Nov. 1. The output of ferroalloys was 19,964 tons, mostly ferromanganese.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for August and the three months preceding:

Pig Iron Production by Districts—Gross Tons

	Nov. (30 days)	Oct. (31 days)	Sept. (30 days)	Aug (31 days)
New York	130,335	95,897	149,300	193,983
New Jersey	5,000	5,340	4,893	5,575
Lehigh Valley	100,402	91,593	78,003	89,718
Schuylkill Valley	69,876	67,368	49,137	39,309
Lower Susquehanna and Lebanon Valleys	50,540	40,719	30,813	38,073
Pittsburgh district	646,122	579,439	578,552	651,546
Shenango Valley	147,795	132,595	139,548	156,202
Western Pennsylvania	83,867	66,928	130,121	132,815
Maryland, Virginia and Kentucky	65,101	59,943	54,662	39,844
Wheeling district	16,801	8,675	96,778	119,260
Mahoning Valley	173,334	37,805	233,241	324,004
Central and Northern Ohio	195,107	154,102	198,771	206,414
Southern Ohio	62,526	68,094	64,906	66,620
Chicago district	376,378	172,431	385,187	410,591
Mich., Minn., Mo., Wis., Colo. and Wash.	64,730	56,547	81,400	81,465
Alabama	187,833	213,298	200,602	178,752
Tennessee	16,603	12,784	12,051	9,217
Total	2,392,350	1,863,558	2,487,965	2,743,388

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from September, 1918, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
September, 1918	83,579	30,363	113,942
October	83,686	28,796	112,482
November	83,395	28,407	111,802
December	81,445	29,317	110,762
January, 1919	78,388	28,137	106,525
February	78,910	26,096	105,006
March	73,468	26,217	99,685
April	61,289	21,318	82,607
May	51,187	16,815	68,002
June	51,865	18,630	70,495
July	61,503	16,837	78,340
August	68,018	20,478	88,496
September	60,954	21,978	82,932
October	41,796	18,319	60,115
November	57,589	22,156	79,745

The figures for daily average production, beginning with January, 1913, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917	1918	1919
Jan.	90,172	60,808	51,659	102,746	101,643	77,799	106,525
Feb.	92,369	67,453	59,813	106,456	94,473	82,835	105,006
Mar.	89,147	75,738	66,575	107,667	104,882	103,648	99,685
Apr.	91,759	75,665	70,550	107,592	111,165	109,607	82,607
May	91,039	67,506	73,015	108,422	110,238	111,175	68,002
June	87,619	63,916	79,361	107,053	109,002	110,793	70,495
July	82,601	63,150	82,691	104,017	107,820	110,354	78,340
Aug.	82,057	64,363	89,666	103,346	104,772	109,341	88,496
Sept.	83,531	62,753	95,085	106,745	104,465	113,942	82,932
Oct.	82,133	57,361	100,822	113,189	106,550	112,482	60,115
Nov.	74,453	50,611	101,244	110,394	106,859	111,802	79,745
Dec.	63,987	48,896	103,333	102,537	92,997	110,762	.....

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steelmaking iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total production			Spiegeleisen and ferromanganese		
	1917	1918	1919	1917	1918	1919
Jan.	2,244,203	1,756,208	2,430,022	38,792	30,695	32,787
Feb.	1,829,846	1,620,254	2,209,470	32,137	26,114	28,105
Mar.	2,285,430	2,349,419	2,277,507	36,563	39,122	26,644
Apr.	2,370,937	2,411,488	1,838,677	39,595	35,511	17,308
May	2,404,380	2,513,577	1,586,805	37,701	54,633	14,604
June	2,304,155	2,407,166	1,655,944	30,829	44,844	14,254
July	2,369,630	2,456,693	1,906,604	43,884	51,762	14,805
Aug.	2,214,513	2,509,357	2,108,566	39,492	54,009	17,419
Sept.	2,198,705	2,507,381	1,828,613	42,235	66,275	20,631
Oct.	2,376,589	2,594,277	1,295,690	48,691	70,379	20,238
Nov.	2,349,545	2,501,867	1,727,656	34,688	59,638	19,964
Dec.	2,094,659	2,524,794	.....	29,902	49,435	.....

The furnaces blown in in November include two Lackawanna and one Susquehanna in the Buffalo district; Topton and one Worth in the Schuylkill Valley; one Steelton in the lower Susquehanna Valley; one American Steel & Wire, No. 4 Clairton and "A" stack of Edgar Thomson in the Pittsburgh district; Sharon and one Shenango in the Shenango Valley; six Johnstown in western Pennsylvania; one Bethlehem in Maryland; No. 2 Ashland in Kentucky; No. 1 LaBelle and Nos. 3 and 4 Mingo in the Wheeling district; Anna, Tod, Nos. 1, 2 and 6 Ohio, Cherry Valley, Mattie, and one Haselton in the Mahoning Valley; two American Steel & Wire, one River and one Toledo in central and northern Ohio, Milton and No. 1 Wellston in southern Ohio; one Calumet and one Federal in the Chicago district; one Zug in Michigan, and one Minnesota Steel in Minnesota.

Among the furnaces blown out are No. 4 Eliza in the Pittsburgh district; one Columbus and one Toledo in central and northern Ohio; one Gadsden, one City and one Hattie Ensley in Alabama, and LaFollette in Tennessee.

Capacities in Blast Sept. 1

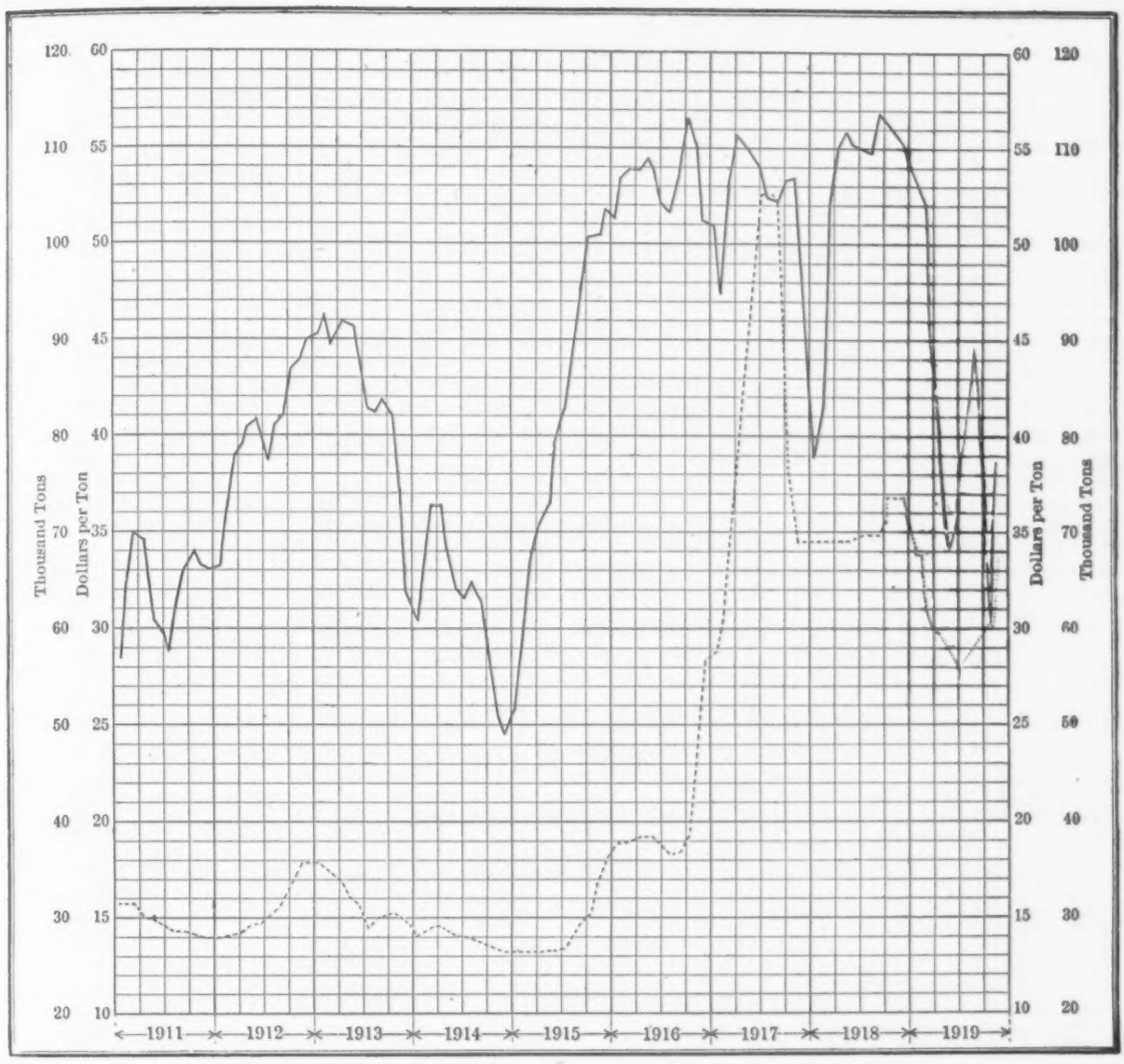
The following table shows the number of furnaces in blast Dec. 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast Nov. 1, Oct. 1 and Sept. 1:

Coke and Anthracite Furnaces in Blast

Location of Furnaces.	Total stacks	Dec. 1 In blast	Dec. 1 Capacity per day	Nov. 1 In blast	Nov. 1 Capacity per day	Oct. 1 In blast	Oct. 1 Capacity per day
New York:							
Buffalo	22	13	3,645	10	3,095	7	1,925
Other New York	4	3	680	3	520	1	265
New Jersey	5	1	170	1	170	1	160
Pennsylvania:							
Lehigh Valley	18	13	3,230	13	3,230	11	2,490
Spiegel	2	1	150	1	165	1	150
Schuylkill Valley	15	9	2,350	7	2,175	6	1,845
Lower Susquehanna	9	3	1,020	2	755	2	875
Ferro	1	1	75	1	75	1	60
Lebanon Valley	9	3	590	2	365	1	170
Ferro	1	0	0	1	60	1	60
Pittsburgh District	53	48	20,990	46	18,435	35	15,035
Ferro and Spiegel	5	2	315	2	250	2	250
Shenango Valley	19	15	5,100	12	4,280	8	3,400
Western Penn.	27	14	4,045	9	2,185	9	2,185
Ferro	1	1	50	0	0	0	0
Maryland	4	4	1,200	3	970	2	540
Wheeling District	15	4	1,050	1	600	1	600
Ohio:							
Mahoning Valley	27	17	6,945	9	1,640	0	0
Central & Northern	26	16	6,785	14	5,035	11	4,490
Southern	17	12	3,170	10	2,700	8	2,300
Illinois and Ind.	40	24	12,745	22	8,345	8	4,030
Mich., Wis. and Minn.	13	8	2,250	6	2,015	6	1,725
Colo., Mo. and Wash.	8	0	0	0	0	0	0
The South:							
Virginia	17	6	765	6	705	6	705
Kentucky	7	4	705	3	590	3	570
Alabama	44	22	6,055	24	6,805	26	6,500
Ferro	1	0	0	1	75	1	75
Tennessee	17	5	470	4	385	4	385
Total	428	249	84,550	213	65,625	162	50,700

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2 X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1915—Gross Tons.

	1915	1916	1917	1918	1919
Jan.	1,601,421	3,185,121	3,150,938	2,411,768	3,302,260
Feb.	1,674,771	3,087,212	2,645,247	2,319,299	2,940,168
Mar.	2,063,834	3,337,691	3,251,352	3,213,091	3,090,243
Apr.	2,116,494	3,227,768	3,334,960	3,288,211	2,478,218
May	2,263,470	3,361,073	3,417,340	3,446,412	2,108,056
June	2,380,827	3,211,588	3,270,055	3,323,791	2,114,863
July	2,563,420	3,224,513	3,342,438	3,420,988	2,428,541
Aug.	2,779,647	3,203,713	3,247,947	3,389,585	2,743,388
Sept.	2,852,561	3,202,366	3,133,954	3,418,270	2,487,965
Oct.	3,125,491	3,508,849	3,303,038	3,486,941	1,863,558
Nov.	3,037,308	3,311,811	3,205,794	3,354,074	2,392,350
Dec.	3,203,322*	3,178,651	2,882,918	3,433,617	.....
11 mos.	27,459,244	35,861,705	35,303,063	34,072,430	27,949,610
Total, yr	*29,662,566	39,039,356	38,185,981	38,506,249	.....

*These totals do not include charcoal pig iron. The 1918 production of this iron was 347,224 tons.

Blast Furnace Notes

No. 1 Temple furnace at Temple, Pa., will probably go in blast this week. The company is now in the hands of a receiver. The furnace manager is W. L. Wolf. Both furnaces have been idle since January, 1919.

The Thomas Furnace Co., Milwaukee, is completing the relining of its furnace and the repairing of stoves. Some repairs have also been made on the company's dock. A new pig casting machine and a new skip have been installed and steel coke bins have been built. A gantry crane has been provided for handling pig iron and slag for storage. The company will be prepared when the furnace blows in to produce non-copper bearing low phosphorus pig iron.

The American Manganese Mfg. Co. expects to blow in its Lochiel furnace near Harrisburg, Pa., about December 15.

Australian Steel Output

The output of the Newcastle steel works of the Broken Hill Proprietary Co. in Australia was as follows in the last two fiscal years ended May 31:

	1918	1919
Pig iron, tons	109,154	155,172
Steel ingots, tons	141,889	178,002
Coke, tons	109,069	174,040
Sulphate of ammonia, tons	1,718	2,630

At the furnace producing foundry iron, 841 tons of spiegel and ferro-manganese was produced. It is now possible to supply all the demands of the country for any kind of pig iron. The open-hearth capacity is being increased by the addition of two new furnaces. There are now 99 coke ovens in operation with 57 under construction. There are 39 still to be added making 195 in all when the plant is completed.

SELLING MACHINE TOOLS

Surplus Valued at $4,000,000 to Be Described in Government Bulletin

WASHINGTON, Dec. 2.—The Director of Sales of the War Department is again pushing the sale of machine tools in the United States. This is particularly the result of Secretary Baker's announcement that American purchasers would have the first call on these tools, despite the pressure from the industry itself to divert these to Europe. According to an official War Department announcement the Machine Tools Section of the Office of the Director of Sales has prepared and will distribute to dealers and users of machine tools throughout the various district selling offices of the War Department a comprehensive bulletin, listing approximately 2500 machine tools, valued at about $4,000,000, which the Government is offering for sale. The machine tools are listed in the bulletin according to their class, type, size and maker, together with the address of the district office having the tools for sale. A brief description of each tool is given, including its "service condition." This bulletin will be revised from time to time as sales are made, or as additional machines are declared surplus. It is expected that the next issue will be published Dec. 1, 1919, followed by new bulletins to be issued every 15 days thereafter. Copies of this bulletin may be obtained from the following bureau district offices:

AIR SERVICE—MATERIALS DISPOSAL BRANCH

811 Little Building, Boston.
2050 Elmwood Avenue, Buffalo.
230 East Ohio Street, Chicago.
Care Maxwell Motor Co., East 1st Street and B. & O. R. R., Dayton, Ohio.
Care Aviation General Supply Depot, Springwells, Detroit.
360 Madison Avenue, New York.
Postal Telegraph Building, San Francisco.

ORDNANCE SALVAGE BOARD, COMMISSION ON SALE OF BUILDING AND EQUIPMENT

Columbia Avenue and B. & O. R. R., Baltimore.
19 Portland Street, Boston.
945 Main Street, Bridgeport, Conn.
74th and Ashland Avenue, Chicago.
Walsh Building, Third and Vine streets, Cincinnati.
Twenty-second Street and Prospect Avenue, Cleveland.
35 Washington Boulevard, Detroit.
1107 Broadway, New York.
1710 Market Street, Philadelphia.
Fortieth and Butler streets, Pittsburgh.
82 North St. Paul Street, Rochester, N. Y.
Missouri State Life Building, St. Louis.
Room 21, 43 Victoria Street, Toronto, Canada.

M. AND E. M. SECTION, SURPLUS PROPERTY

Transportation Building, Atlanta, Ga.
Coca Cola Building, Baltimore.
108 Massachusetts Avenue, Boston.
1819 West Thirty-ninth Street, Chicago.
Jeffersonville, Ind.
461 Eighth Avenue, New York.
Audubon Building, New Orleans.
Omaha, Neb.
Twenty-first Street and Oregon Avenue, Philadelphia.
Second and Arsenal Streets St. Louis.
Fort Mason, San Francisco.
San Antonio, Texas.
El Paso, Texas.

SIGNAL CORPS

Textile Building, Boston.
Army Building, 230 East Ohio Street, Chicago.
8-10 Bridge Street, New York.

An American Sintering Process at British Plants

An American process for the sintering of fine iron and sulphide ores is about to be adopted by six Welsh iron and steel and zinc manufacturers, says American Vice-Consul B. F. Hale, Swansea, Wales. A representative of a well-known American metallurgical company (the Dwight-Lloyd) was recently in the Wales district at the invitation of leading manufacturers, and has succeeded in placing orders with six concerns for his company's patent equipment for sintering ores. Some of the plants are to sinter Scandinavian concentrates. As Swansea is one of the metallurgical centers of the United Kingdom, great importance may be attached to this introduction of an American process for sintering. A German sintering apparatus recently adopted by a large iron and steel plant in Swansea has not been wholly satisfactory.

The Dwight-Lloyd process is being used in one or two plants in France, particularly the Société de Peñarroya at Marseilles, where certain lead ores are treated.

British Steel Exports Less than Half the Pre-War Rate

Extreme slowness in the recovery of Great Britain's export trade in iron and steel is still a feature. The increase has been very little as the year has progressed, and the movement is still very much less than even early in the war. The average for the first 10 months of this year was only 181,621 gross tons per month, as against 169,563 tons per month in the first half. In 1915 and 1916 the average exports were 200,670 tons and 279,695 tons per month respectively, while the 1917 rate was about the same as at present. How far the industry must travel to reach its pre-war status will appear from the statement that exports were 420,757 tons per month in 1913.

Imports have increased slowly each month this year. To Nov. 1 these have been 48,856 tons per month, the October receipts having been 87,892 tons, or the largest for the year. The averages were 107,550 tons and 64,404 tons per month in 1915 and 1916 respectively. In peace times the imports were 195,264 tons per month, so that the October imports are only a little less than half of the pre-war record.

The following table shows the exports and imports of iron and steel, excluding iron ore and including scrap, for each month this year, with other data for comparison.

British Steel Exports and Imports—Gross Tons

1919	Exports	Imports
January	170,543	52,569
February	109,939	46,247
March	159,529	34,956
April	173,606	14,367
May	208,179	35,031
June	195,582	40,724
July	191,724	47,912
August	214,632	50,995
September	191,140	76,163
October	201,287	87,892
Total to Nov. 1, 1919	1,816,211	486,856
Total to Nov. 1, 1918	1,358,850	284,216
Total in 1913	5,049,090	2,343,173
Average per month, 1913	420,757	195,264

The October exports this year were less than half the pre-war or 1913 rate. The improvement in exports to Nov. 1 over the same period in 1918 has been principally in rails, galvanized sheets, wire and steel plates, as shown by the following table:

	To Nov. 1, 1919	To Nov. 1, 1918
Rails	97,752	23,559
Galvanized sheets	131,340	7,095
Wire	20,500	4,523
Plates, ⅛ in. and over	205,598	77,316
Other Products		
Steel bars	211,123	133,399
Tin plates	236,513	187,732
Black plates	24,108	3,196
Black sheets	114,838	93,658
Pig iron	198,959	361,254

Imports of pig iron to Nov. 1 of this year were 137,577 tons as compared with 97,690 tons to Nov. 1, 1918. Receipts of iron ore have fallen off decidedly, the year's total to Nov. 1 having been 4,493,188 tons, as against 5,601,465 tons to Nov. 1, 1918. To Nov. 1, 1913, these imports were 6,371,989 tons.

Manganese ore imports are also small. They were only 9827 tons in October, making the total to Nov. 1, this year, 242,095 tons, as against 484,253 tons to Nov. 1, 1913, indicating that 1919 receipts have been at only half the rate before the war.

Waste Material Dealers at Quarterly Meetings

The National Association of Waste Material Dealers will hold a series of meetings at the Hotel Astor and at the association's headquarters at the Times Building, New York, Dec. 8, 9 and 10. The metal division will meet Monday afternoon, Dec. 8, at 2.30 p. m.; the Foreign Trade division meeting will be held Dec. 9 at 11.30 a. m. The regular quarterly meeting of the association will take place at 2 o'clock, Dec. 10, at the Hotel Astor. The board of directors will meet at headquarters Dec. 9 at 4 p. m. The members of the Credit Bureau will hold a dinner and conference at the Hotel Astor Dec. 8 at 6.30 p. m., at which able speakers will appear. The bureau now has a membership of 115. A permanent chairman of each division will be elected at these meetings.

Iron and Steel Markets

OUTPUT CUT DOWN

Furnaces Stop for Lack of Coal

Demand for Steel Grows Daily—Further Advance in Pig Iron—November Gain in Production

The coal shortage is shutting off iron and steel production in a number of districts and the industry will soon face serious curtailment unless coal output can be materially increased. The return of the wartime ban on certain uses of fuel will affect all industry and the place of steel in peace time will be much farther down on the essential list than in the heatless days of 1918.

The Bethlehem Steel Co. has been compelled to bank four blast furnaces. At South Chicago, the Illinois Steel Co. has banked five blast furnaces and blown out one. It has blown out one at Gary and shut down two batteries of coke ovens at Gary and one at Joliet. Most of the bar iron and rerolling mills in the Chicago district are idle, and two iron mills at Cleveland. Secondary industries are being affected also, an Indiana nut and bolt plant having been forced to close down.

Pig iron production made a marked recovery in November from the October slump, due to the steel strike. The total last month was 2,392,350 tons, or 79,745 tons per day, against 1,863,558 tons in October, or 60,115 tons per day. From the present outlook December will show a considerable lapse from last month's performance.

The number of furnaces in blast Dec. 1 was 251, with estimated capacity of 84,550 tons per day, whereas on Nov. 1 only 213 furnaces were running, capable of producing 65,625 tons per day. The net gain in furnaces is thus 38 and in capacity about 19,000 tons per day.

With the coal situation so much more threatening, steel companies have brought their sales departments to a standstill; but meantime demand is coming in from all directions, so that business to the extent of tens of thousands of tons is piling up that the mills cannot consider. Companies not committed to the policy of holding down prices are reaping the benefit of premium prices, but the total of such business is not significant.

Coal scarcity and the fear of a fresh curtailment of blast furnace output has caused a further sharp rise in pig iron, the week's advance being from $2 to $3. In Eastern Pennsylvania the delivered price is now very close to the $40 level that was predicted when iron was $10 lower. Basic, Bessemer and foundry irons in the Central West are about $2 per ton higher. Inquiry for foundry iron for next year is still large. Several producers are out of the market and the situation steadily grows tighter.

Under heavy demand for reinforcing bars, as high as 3.5c. has been paid. Buyers have lifted the steel bar market very considerably above the 2.35c. basis of the March 21 schedule. Eastern transactions in the past week have been successively at 2.75c., 2.87½c. and 2.90c., Pittsburgh, this last price being paid by jobbers. A late sale of a round lot was at 3c. Bar iron production in the East has been increased by the settlement of a long-standing strike at Lebanon, but the tendency of prices is still upward.

The distribution of 200,000 tons of rails by the Pennsylvania Railroad for 1920 has not been completed, but the Bethlehem Steel Co. has taken 56,000 tons. Only formalities are needed to convert the 300,000 tons of rails pending at Chicago into contracts.

Export business, like that at home, can have little consideration under present conditions. From China an inquiry has come for several thousand tons of steel for pier work. A Glasgow buyer has offered 2.75c. at Pittsburgh for 1500 tons of ship plates. Under present freights and at $4 exchange, the delivered price would figure out fully $10 per ton below the present level in Great Britain.

The irregularity in high speed tool steel prices has disappeared to some extent, and leading makers are now asking $1.40 as against a recent range of $1.30 to $1.35.

The last of the Lake Superior iron ore shipments will come down the Lakes this week. The total movement by water for the season will be about 48,000,000 tons, against 61,000,000 tons last year and 62,500,000 tons in 1917.

Some large machine-tool orders have been placed in the East in the past week. Two companies prominent in the automotive industry have purchased equipment amounting, roughly, to $1,500,000. An oil company has bought about $150,000 worth of machinery for the Rumanian oil fields. With many machine-tool builders current business almost reaches a war volume. Some are sold up for months.

Pittsburgh

PITTSBURGH, Dec. 2.

The situation in regard to the supply of pig iron, semi-finished steel and finished steel products seems to be getting more serious, and were it not for the fact that subsidiaries of the Steel Corporation have put on the brake against any advances in prices over those of March 21 last, and that this has also been done by some of the large independent steel companies, there is no doubt that there would be a runaway market on nearly everything. As it is, a few producers of steel are quoting premiums over March prices, but the amount of business that has been placed so far in finished steel products at premium prices is small. A very large tonnage of finished steel products will be carried over into next year, a result of the steel strike.

Pig Iron.—The demand for all grades of pig iron continues very active, and prices are fully $2 a ton

higher than those of a week ago. W. P. Snyder & Co. report the average price of basic in November to have been $30.16, and of Bessemer $30.20, both at Valley furnace. These average prices show basic to have been only 4c. under Bessemer, but this is explained by the fact that in the last week of November there were heavy sales of basic at high prices, which brought the average up very much. We note sales of Bessemer and basic during the week at prices ranging from $32 to $34 on Bessemer, and from $31 to $33 on basic at Valley furnace. We have advanced prices and now quote Bessemer iron, $33.50; basic, $33; No. 1 foundry, $33.25; No. 2, $32.50; No. 3, $31.50; malleable, $33, and gray forge, $33, all at Valley furnace. The sales of Bessemer, basic and foundry iron in November were the heaviest in any month this year, and prices on nearly all grades showed an advance of $7 per ton over October.

Billets and Sheet Bars.—The demand for billets and sheet bars is much heavier than the available supply and prices are very strong. Bessemer and open-hearth 4 x 4 in. billets are $43 to $45; sheet bars, $46 to $47, and forging billets close to $60, at maker's mill, Pittsburgh or Youngstown.

Ferroalloys.—Sales of 300 to 400 tons of domestic ferromanganese are reported at $120 delivered for 78 to 82 per cent. There have also been very heavy sales of Bessemer ferrosilicon and silvery iron at the advance in prices of $2 per ton noted in this report last week.

Finished Material.—The demand for all kinds of finished steel, especially for sheets and tin plate, plates, and tubular goods, continues very heavy. Some mills are asking $3 to $5 per ton premiums over prices of March 21 last, but it is not believed much business has yet been done at these advances. The McClintic-Marshall Co. has taken 4500 tons for overhead runways for the Union Shipbuilding Co., Baltimore; 600 tons for new steel buildings for the Aluminum Co. of America at Marysville, Tenn., and 400 tons for the recently organized Canton Sheet Steel Co., Canton, Ohio. The American Bridge Co. has taken 1000 tons for a power-house in Detroit, 700 tons for bridge work for the Pennsylvania Lines West, 6000 tons for an office building for the Atlantic Refining Co., Philadelphia, and 600 tons for a boiler house for the Standard Oil Co., Toledo, Ohio. The Bethlehem Steel Co. will get 3000 tons of grey shapes for the new sheet mill building of Follansbee Brothers Co., at Toronto, Ohio. Plates are selling freely at 2.65c. to 2.75c. at maker's mill. Soft open-hearth and Bessemer wire rods have sold at $58, and wire nails are very firm at $3.50 to $4 base, a few mills quoting the higher price, and reported to be taking orders.

Cold-Rolled Steel Bars.—The demand is reported to be heavy, and some makers are quoting as high as 3.75c. in carloads and 4c. in small lots. However, several of the larger makers are still quoting 3.50c., and this is regarded as the general price for carload lots.

Cold-Rolled Strip Steel.—Nearly all makers report they have taken large contracts for first quarter delivery at $6 base per 100 lb. f.o.b. Pittsburgh, and this price now seems to be minimum of the market.

Old Material.—Sales of 10,000 to 15,000 tons of selected heavy steel scrap are reported at $23 per gross ton, delivered to consumer's mill. One leading local consumer has been buying heavily, partly to protect itself against a possible shortage of pig iron. The available supply of scrap is large, but dealers who have large stocks piled in their yards are inclined to hold it for higher prices, which they say are certain to come in view of the very active market for pig iron and the higher prices ruling.

Coke.—Negotiations are under way for very large quantities of furnace coke for delivery in first half of next year, but intending buyers are slow to close until there is something more definite on the coal strike. Some producers of coke insist on inserting a clause in their contracts to protect them against an advance in coal miners' wages higher than the 14 per cent agreed upon by the Government. We note some sales of prompt furnace coke at $6 per net ton and some sales are reported at $6.50 per net ton. Selected 72-hr. foundry coke has sold as high as $7.50 per net ton at oven for prompt shipment. Output of coke for the week ending Nov. 22 was nearly 3000 tons, the heaviest in any week since the steel strike started.

Philadelphia

PHILADELPHIA, Dec. 2.

Pig Iron.—The failure of the Government to end the coal strike, together with the scarcity of pig iron and the fear that a coke shortage may curtail furnace output have forced prices of foundry metal up from $2 to $5 a ton. One large Eastern producer, whose price on No. 2x iron, 2.25 to 2.75 silicon, was $35 furnace less than two weeks ago is now quoting $40, furnace, on the same grade. This is an extreme case, but it illustrates the chaotic condition of the market. Some furnaces are willing to sell No. 2x at $37, furnace, but the majority of current transactions for early delivery are close to $40, delivered. Iron from other districts, notably Virginia and Buffalo, is coming in at scarcely less than $40, delivered, and in some cases more than that amount is being obtained. The leading Virginia interest has sold 15,000 tons of foundry iron of 2.25 to 2.75 per cent and higher silicon at prices based on $36.25, furnace, or $40.35, delivered Philadelphia, for the 2.25 to 2.75 per cent grade. Buffalo iron analyzing 1.75 to 2.25 per cent silicon has been quoted for delivery in this district at $38, furnace. Buyers are in most cases willing to pay the prices asked by the furnaces. Some furnace operators apparently have no desire to take advantage of the situation in exacting larger profits, but have raised their prices because they are not anxious to sell. Transactions for early delivery are confined almost entirely to small lots. Inquiries for first quarter and first half are fairly numerous, but no large tonnages are asked for. Some consumers seem to feel that the present high prices will not last if the coal situation reaches an early settlement, and therefore they are buying cautiously. Steelmaking iron is not in great demand, but a few thousand tons of basic for delivery in the first quarter has been sold at $32, delivered, with $35 now being quoted by makers. Two thousand tons of standard low phosphorus iron for delivery in first half has been sold at $42, furnace, an advance of $2 from the last reported sale. Copper-bearing low-phosphorus iron has sold at $38, furnace, but $37 is still quoted. The Robesonia Iron Co., whose furnace has been on foundry iron for some months, will start making low phosphorus iron again this week. The coal situation has forced the Bethlehem Steel Co. to bank four furnaces at Bethlehem, which were on steelmaking iron. Insufficient supplies of coking coal have caused a shortage of by-product coke at that plant.

Ferroalloys.—The leading producer of ferromanganese has sold about 1000 tons in the past few days at the new price, $120, delivered. Spiegeleisen is quoted at $35 and $36, furnace, for the 18 to 20 per cent grade, but one producer has advanced its price to $45.

Semi-Finished Steel.—There is a scarcity of billets, slabs and sheet bars and little business is being done. One Eastern producer has sold small lots of open-hearth re-rolling billets to regular customers at $44, Pittsburgh, but would not accept orders for large tonnages. Another producer has no definite price, but would quote not less than $50, Pittsburgh, for open-hearth re-rolling billets and $60 to $65, Pittsburgh, for forging billets.

Finished Material.—The Bethlehem Steel Co. is virtually out of the market on all forms of finished steel except plates and shapes. Some small orders for steel bars are being taken at 3c and 3.25c, Pittsburgh, but such business is accepted reluctantly. The Midvale Steel & Ordnance Co., which has had only plates to sell, is now out of the market even on plates. Some business in alloy steel and forgings is being taken. Slow progress is being made in resuming production of finished steel at the company's Johnstown plant, but

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

	Dec. 2, 1919	Nov. 25, 1919	Nov. 4, 1919	Dec. 3, 1918
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia‡	**$38.10**	$36.10	$33.10	$39.15
No. 2, Valley furnace†	**32.50**	32.00	30.00	34.00
No. 2 Southern, Cincinnati	**37.60**	36.60	32.60	37.60
No. 2, Birmingham, Ala.†	**34.00**	33.00	29.00	34.00
No. 2, furnace, Chicago*	**35.00**	32.00	28.75	34.00
Basic, deliv., eastern Pa.	**32.00**	31.25	28.00	36.90
Basic, Valley furnace	**33.00**	30.00	25.75	33.00
Bessemer, Pittsburgh	**35.40**	32.90	29.35	36.60
Malleable, Chicago*	**35.50**	32.50	29.25	34.50
Malleable, Valley	**33.00**	32.00	29.25	34.50
Gray forge, Pittsburgh	**33.40**	32.40	28.15	34.40
L. S. charcoal, Chicago	**40.00**	39.00	35.50	38.85
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy, at mill	45.00	45.00	45.00	55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	43.00	43.00	38.50	47.50
O.-h. billets, Pittsburgh	43.00	43.00	38.50	47.50
O.-h. sheet bars, P'gh	46.00	46.00	42.00	51.00
Forging billets, base, P'gh.	**60.00**	58.00	51.00	60.00
O.-h. billets, Phila	**48.00**	47.50	47.50	51.50
Wire rods, Pittsburgh	**58.00**	55.00	53.00	57.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	3.245	3.245	2.995	3.745
Iron bars, Pittsburgh	3.25	3.25	3.00	3.50
Iron bars, Chicago	2.77	2.77	2.72	3.50
Steel bars, Pittsburgh	2.75	2.75	2.50	2.90
Steel bars, New York	3.12	3.12	2.77	3.17
Tank plates, Pittsburgh	2.65	2.65	2.65	3.25
Tank plates, New York	2.92	2.92	2.92	3.52
Beams, etc., Pittsburgh	2.45	2.45	2.45	3.00
Beams, etc., New York	2.72	2.72	2.72	3.27
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh	3.25	3.25	3.05	3.50

	Dec. 2, 1919	Nov. 25, 1919	Nov. 4, 1919	Dec. 3, 1918
Sheets, Nails and Wire,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh.	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh	3.50	3.50	3.50	3.50
Plain wire, Pittsburgh	3.10	3.10	3.85	3.25
Barbed wire, galv., P'gh.	4.25	4.25	4.25	4.35
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	$30.00	$30.00	$25.50	$29.00
Carwheels, Philadelphia	30.00	30.00	25.00	29.00
Heavy steel scrap, P'gh.	23.00	23.00	21.00	27.50
Heavy steel scrap, Phila.	**22.50**	21.50	20.00	27.00
Heavy steel scrap, Ch'go.	20.50	20.50	18.00	26.50
No. 1 cast, Pittsburgh	28.00	28.00	26.00	28.00
No. 1 cast, Philadelphia	**30.00**	29.00	26.00	29.00
No. 1 cast, Ch'go (net ton)	29.50	29.50	25.50	27.00
No. 1 RR. wrot, Phila	30.00	30.00	27.50	34.00
No. 1 RR. wrot, Ch'go (net)	23.00	23.00	19.50	28.00
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	**$6.50**	$6.00	$5.50	$6.00
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	7.00	7.00	7.00	7.00
Foundry coke, future	7.00	7.00	6.50	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*18.75*	19.50	21.75	26.00
Electrolytic copper, N. Y.	*18.25*	19.00	21.25	26.00
Spelter, St. Louis	**8.10**	7.85	7.55	8.25
Spelter, New York	**8.45**	8.20	7.90	8.60
Lead, St. Louis	6.55	6.55	6.50	6.75
Lead, New York	6.75	6.75	6.75	7.05
Tin, New York	*54.00*	54.12½	56.00	70.00
Antimony (Asiatic), N. Y.	9.25	9.25	8.75	8.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

ingots are being made and piled against future needs. The company is at least four months behind on bars and wire products and its order book for structural shapes is also badly congested. Two or three Eastern plate mills are now selling at 2.75c, Pittsburgh, while a smaller mill is getting 3c, Pittsburgh, for early delivery. A good deal of ship tonnage is still in the market. The structural steel market is fairly active, and some of the smaller mills are getting $2 to $3 a ton premium for small lots. The strike of puddlers at the plants of the Bethlehem Steel Co. and Lebanon Valley Iron & Steel Co. at Lebanon, Pa., which has been on since last April, has been settled, and these plants are now producing bar iron in almost normal quantities. Some Eastern makers of bar iron have advanced prices again $5 a ton on lots of less than 10 tons, making the new price for such small lots 3.25c, Pittsburgh. The distribution of the 200,000 tons of heavy rails needed by the Pennsylvania Railroad in 1920 has not been completed, but the Bethlehem Steel Co. has taken 56,000 tons and the Lackawanna Steel Co. 12,000 tons. The Carnegie Steel Co. and the Illinois Steel Co. will probably furnish the bulk of the tonnage.

Old Material.—The Alan Wood Iron & Steel Co. has bought 6000 tons of heavy melting steel at $22.50, delivered. Another consumer has paid $24, delivered, for 500 tons. A Philadelphia dealer has refused an offer of $24, delivered, for shipment to the Pittsburgh district. Other grades of scrap, notably cast scrap, are in good demand, with some higher prices being paid.

Chicago

CHICAGO, Dec. 2.

Iron and steel production is being steadily curtailed on account of the coal shortage. The leading interest has banked five blast furnaces at South Chicago and has blown out one each at that plant and at Gary. It has also shut down two batteries of coke ovens at the latter works and one at Joliet. It is attempting to keep up the output of finished products by a more extensive use of scrap in the open-hearth furnaces. The foremost independent is using coking coal for steam and gas purposes, but has not yet been forced to curtail operations materially. Most of the rail-carbon and bar-iron rolling mills in this district have been forced to shut down. Concurrent with diminishing production is a steadily increasing demand from both domestic and foreign sources. The leading independent is sold up on sheets, bars, plates and shapes, except heavy sizes of the latter, until July 1. The foremost interest is also booked ahead throughout the first half on mild steel bars. Prompt deliveries on soft steel bars are commanding as high as 3c. to 3¼c., Pittsburgh, and much of the material selling at these prices is not up to standard. The demand for sheets is exceptionally strong, from $20 to $25 premium per ton having been offered on galvanized and black sheets by foreign purchasers. Only a few final formalities stand between the foremost interest and bookings for 300,000 tons of rails for Western railroads. The market for light rails is also decidedly active, numerous purchases having been made by both domestic and foreign consumers. Among recent orders from Japan were two for 1200 and 1600 tons respectively. There is a growing scarcity of billets throughout the country, with the result that Eastern plants are looking to Chicago for their requirements. Local producers, however, are well booked ahead, and find it difficult to make the deliveries desired. One recent Eastern inquiry calls for 3000 tons of rerolling billets.

Bars.—Practically all bar-iron makers in this locality have closed down. The Interstate Iron & Steel Co., however, is still able to take care of a limited tonnage for delivery this year. Only one rail-carbon bar mill is still taking business and it is asking 3c. mill.

Cast Iron Pipe.—Cast iron pipe has advanced $3 to $65.80 a ton, Chicago, for 4-in. water pipe and $62.80 for 6-in. and larger sizes. The United States Cast Iron Pipe & Foundry Co. has been awarded 3300 tons of pipe by Toledo.

Plates and Shapes.—An inquiry for the 3000 freight cars will call for about 36,000 tons of plates, shapes and bars and 5000 tons of axles. A road in the Northwest

is in the market for 1000 stock cars which will involve about 2000 tons of steel. Fabricating awards are numerous, and some of them involve substantial tonnages. The Worden Allen Co. alone has booked 7400 tons of steel within the past week, of which 4500 tons will be used in the construction of a plant for the A. O. Smith Corporation, Milwaukee, and 1200 tons will be required in the erection of a rail mill building for the Inland Steel Co., Indiana Harbor, Ind. Awards to other fabricators during the past few days account for 1100 tons additional. Bids are now being taken on 2500 tons for the Magnolia Building, Dallas, Tex. The Wrigley Building, Chicago, plans for which are now being drawn, will involve between 2000 and 3000 tons.

Nuts and Bolts.—An Indiana bolt and nut plant will have to close this week on account of the coal shortage. The demand for this material continues far in excess of the supply. An Ohio consumer is in the market for 7,000,000 bolts, and it is doubtful whether he will be able to cover for his needs. The leading interest which has been taking small orders for wire products to accommodate old customers is now altogether out of the market, being unwilling to make further commitments, no matter how small, in the face of the present fuel situation.

Pig Iron.—With all foundries exceptionally busy, the pressure for pig iron is increasingly strong. All available spot material is being seized as soon as it appears. One local seller who sent an announcement to the trade listing about 700 tons of spot Valley iron received an order by wire for the total tonnage. This instance is typical of what is happening every day. A local broker who recently sold 1000 tons of malleable for prompt and first quarter delivery at $33 Valley furnace, as noted last week, has disposed of a like tonnage for prompt shipment at $35 Valley furnace. Two important Southern interests have withdrawn from the market after selling at $35 base Birmingham for foundry, 1.75 to 2.25 per cent silicon for prompt and first quarter delivery. A remaining Southern producer continues to take some prompt business at $34. A Virginia furnace is offering foundry for first quarter only at $36 base furnace, with a $4.90 freight rate to Chicago. The foremost Northern producer recently sold a few small tonnages to customers at the $35 base furnace for 1.75 to 2.25 per cent silicon. It is estimated that as a result of the steel strike this producer's deliveries were set back about 200,000 tons. Jackson county silvery furnaces are again taking business on the basis of $46.50 furnace for 6 per cent material, $48 for 7 per cent and $50 for 8 per cent. Charcoal iron makers are well sold ahead, and are asking a minimum of $40 furnace for iron averaging 1.50 per cent silicon.

New York

NEW YORK, Dec. 2.

Pig Iron.—The scarcity of pig iron has become more pronounced during the past few days and the market has become almost feverish. The leading Virginia producer, after having made sales of a fair tonnage at $35 furnace for No. 2x for the first half of next year, has retired from the market and there is very little Virginia iron from any company available and prices are tending rapidly upward. It is doubtful whether any Virginia iron can be obtained at less than $37 furnace. Pennsylvania furnaces have very little iron to sell for this year and some are quoting $38 furnace for No. 2x for next year and $40 furnace for No. 1. The differential between the lower and higher grades of silicon is greater than usual on account of the strong demand for high-silicon irons. For delivery this year or next, $38 furnace seems to be the minimum in eastern Pennsylvania for No. 2x. Buyers are exerting unusual pressure on furnaces to deliver on contracts as they realize that producers are being tempted to sell any iron that they can for spot delivery. One agency sold 3000 to 4000 tons eastern Pennsylvania No. 2x at $38 furnace and some Virginia foundry iron, No. 2x 4 per cent silicon, at $40. One furnace has sold a little iron at $36.25 furnace for No. 2x and then withdrew from the market. A fair tonnage of basic has been sold at $35 Pennsylvania furnace.

Ferroalloys.—American producers of ferromanganese have sold from 1500 to 2000 tons of 78 to 82 per cent alloy at $120, delivered, and the market may be characterized as strong and firm at this level. An interesting development is that one British producer has just re-entered the market with offerings of 76 to 80 per cent alloy at $110, seaboard, for first quarter delivery at which moderate sales have already been made. It is reported but unconfirmed that another British maker is ready to take business for delivery in the second quarter. Inquiries from American consumers comprise 1500 tons from one Middle Western high manganese steel maker, as well as other smaller inquiries. It is believed that most of the larger business before the market in the past few weeks has been absorbed at around $110, delivered. The spiegleisen market is active and higher. The minimum quotation is now $37 to $38, furnace, with one or two sellers asking as high as $45. At the lower levels at least 1000 tons has been sold for domestic consumption and at least another 1000 tons is under negotiation. The total inquiries for foreign delivery amount to 4000 tons, of which 2000 is a direct inquiry from German consumers. Ferrosilicon, 50 per cent, is quoted at $80 to $85, delivered, at which levels a fair business is reported. In the absence of a real test of the market quotations for ferrotungsten are nominal at about $1 to $1.25 per lb. of contained tungsten. Ferrochromium, 60 to 70 per cent, carload lots, is quoted at 22c. to 23c. per lb. of contained chromium in which the carbon ranges from 6 to 8 per cent. For less than carload lots 1c. per lb. higher is asked and for alloy in which the carbon range is 4 to 6 per cent an increase of 1c. per lb. over the foregoing quotation is the rule. Ferrovanadium is quoted at $5.50 to $6 per lb. of contained vanadium in wholesale lots for early delivery. Ferrocarbontitanium, 15 to 18 per cent, is selling at $200 per net ton in carload lots, at $220 per ton in lots between one ton and a carload and at $250 per ton in lots less than a ton f.o.b. Suspension Bridge, N. Y.

Finished Iron and Steel.—Insistent pressure by buyers has shown no abatement and premium prices are common. One mill has booked several thousand tons of bars for delivery up to the middle of February at 2.87½c., Pittsburgh, and has followed this with a booking of 1500 tons at 3c. Another mill was offered 100 tons of ovals at no less than 7½c. a lb. for nearby delivery. Most mills are refusing to entertain any business, particularly in bars, being booked for months or not caring to make commitments for over three months. It is substantially impossible at the moment to designate a minimum price on what would normally be an attractive lot and we repeat last week's quotation of 2.85c., Pittsburgh, with the stipulation that small lots command up to 3c. and even higher. In plates several more mills have placed their minimum at 2.75c., Pittsburgh, but 2.65c. still seems possible on attractive lots. For shipment in a few weeks universal plates are obtainable at 2.75c. It is interesting to note that Clyde shipbuilders appear willing to pay on a 2.75c. basis which would represent fully £18 in Scotland compared with a British price of £21 per ton. One inquiry from the Clyde amounts to 1500 tons. Besides the threatened coal strike, freight rate advances not unlikely at the first of the year have been injected into the situation, causing producers to consider commitments carefully with higher manufacturing costs thus possible. In semi-finished steel a sale of 7000 tons of billets at $44 and $45 is noted. In the fabricating field new work includes 300 tons for the New York Telephone Co. in the Bronx; 200 tons for the Second Congregational Church, Holyoke, Mass.; 800 tons for the Standard Guano Co., Baltimore; 2000 tons for a public service power house, Johnstown, Pa.; 300 tons for Lever Brothers, Cambridge, Mass.; 800 tons for the Grace Dodge Hostel, Washington; and 260 tons for pier 18 East River, Snare & Triest Co., general contractor. Several thousand tons are involved in pier

work in China. The Hinkle Iron Co. will supply 500 tons for the Gotham National Bank and the Harris Structural Co., about 650 tons for a theater in Baltimore. The bolt market is notably strong and the recent advances are more general, including track bolts at 5.50c. base in 200 keg lots.

Cast Iron Pipe.—There is an especially heavy demand for the smaller sizes of pipe. Shading of prices is unheard of at this time, the tendency being to raise them, as has already been done in the Middle West. Some manufacturers are having difficulty in contracting for pig iron for next year, which difficulty may be reflected in higher prices later on. Orders are many in quantity, but small in tonnages involved. We quote 6-in. and heavier at $58.30. New York; 4-in. $61.30, with $2 additional for Class A and gas pipe.

Old Material—Prices have advanced from 50 cents to $1 over a week ago. Scrap is continually more difficult to buy as it becomes scarcer and as dealers hold in the hopes that prices will continue the march upward of the past few weeks. One brokerage firm, which issues a weekly list of prices which its representatives are to pay for various grades, has appended the following warning: "Do not exceed these figures for the present, as the coal situation has made most mills adopt a waiting policy and we do not wish to be forced into a premature sale."

Cincinnati

CINCINNATI, Dec. 2.

Pig Iron.—Southern iron for December shipment has disappeared except in small lots of high silicon, for which premiums are paid. The price for first quarter shipment has been advanced to $35, Birmingham, silicon 1.75 to 2.25, but only a few furnaces are willing to accept business at this figure. The nominal price of Northern iron for the same delivery is $35, Ironton, but a small tonnage was disposed of last week at $36.75. Hanging Rock furnaces are out of the running on foundry iron, but have a little malleable to dispose of for further shipment. The inquiry for foundry iron has again been heavy, but there is no district from which supplies can be drawn at the present time. The settlement of labor troubles in Jackson county has enabled the Ohio silvery furnaces to ship iron that has been piled in their yards several months, but all of this metal is due on old contracts. These silvery furnaces are now undergoing repairs.

Coke.—Connellsville furnace coke prices are unchanged around $5.75 to $6, and foundry from $7 to $7.50. Wise county foundry nominal quotations range from $8.50 to $9.50 and New River foundry from $11.50 to $13 at ovens.

Old Material.—The scrap market is inactive, as there is an increasing reduction in consumption due to the coal situation. Comparatively large stocks are being carried in dealers' yards, as they are unable to move the material. No changes in prices are noted and all figures quoted are nominal.

Cleveland

CLEVELAND, Dec. 2.

Iron Ore.—The ore shipping season is practically over, with a movement by water of close to 48,000,000 tons. Several cargoes will be shipped from Escanaba this week, and possibly one or two cargoes from the head of the lakes, but no shipments will be made later than Dec. 5.

Pig Iron.—Inquiries for foundry pig iron for next year continue heavy and prices are still advancing. Several producers are entirely out of the market, and the situation is growing tighter. There is still much inquiry from the Michigan territory, and two Detroit consumers are understood to have been able to purchase a small portion of the iron covered by large inquiries recently sent out. Considerable inquiry is coming from other territories. During the week, foundry iron was advanced $2 per ton to $34 by Cleveland and Valley furnaces, basic iron $3, and Southern foundry December shipment to a northern Ohio consumer, at $33, Birmingham, for December shipment. No. 2 foundry iron has sold as high as $36.75. Inquiries include one from a Michigan melter for 4500 tons and one from an Indiana consumer for 5000 tons. One Southern producer has advanced prices to $34 for 1.75 to 2.25 silicon foundry iron, and has made several sales at this price in this territory, including a 2000-ton lot to a Northern Ohio melter. In the Jackson County district, the Star and Globe furnaces have reached an agreement with their strikers, nad will resume shipment from their stock pile, and will start their furnaces as soon as they can be relined. Jackson County furnaces have opened their books for the first half at $50 for silvery 8 per cent silicon and $59.50 for 11 per cent and $62.50 for 12 per cent bessemer ferrosilicon.

Finished Iron and Steel.—The shortage of coal has become so acute that some of the steel plants in this territory will be forced to greatly curtail production or shut down unless the situation is relieved within a few days. Two Indiana bar iron mills are down because of lack of fuel. The demand for nearly all lines of finished steel is heavy, but mills are sold up so far ahead that few are accepting orders. Some that would still be taking business are not doing so because of the coal situation. The demand for reinforcing bars is unusually heavy and those are quoted as high as 3.50c.

Old Material.—The market is very dull following a fair volume of activity during which several Ohio mills made purchases of heavy melting steel. More scrap is being offered now than there is a demand for. Some dealers think that the price peak has been reached and, in view of the possible curtailment of consumption because of lack of coal, that prices will ease off. Dealers are offering $22 to $23 for heavy melting steel for delivery outside of Cleveland. Foundry grades continue in good demand and are very firm. Most prices are unchanged.

Buffalo

BUFFALO, Dec. 2.

Pig Iron.—Demand runs into a very heavy aggregate, far in excess of what local furnaces feel able to supply. Inquiry before the market for foundry grades total between 45,000 and 50,000 tons. All but two producing interests of the district are sold up for first quarter, and very few furnaces now have much tonnage left uncontracted for for first half. Only one interest has anything at all to furnish for December, and in very limited tonnages and no iron produced here can now be obtained for less than $38 base for No. 2 plain, 1.75 to 2.25 silicon, and with regular silicon differentials up to $41 for 2.75 to 3.25 silicon. Basic is held at $36, and may soon be advanced $1 per ton additonal. No malleable is being produced, although furnaces are swamped with inquiry for it. Nominally the price is $39.25. Bessemer has not been made or quoted on for some weeks by Buffalo furnaces. Many foundries are becoming alarmed about getting necessary supplies and are making all possible effort to secure place on furnace books for additional tonnages.

Old Material.—The market is stronger in all lines. Heavy melting steel is now held at $23 to $23.50, and it is impossible to buy any large tonnages even at the higher figure. There are some large inquiries before the market now that will undoubtedly command at least $25 before buyers are able to obtain their full requirements. Dealers are still holding back on selling material in yards, expecting to realize on further advances. Low phosphorus has been marked up to $27 to $28, and cast iron borings are held at $19 to $20 f.o.b. Buffalo and No. 1 busheling at $20 to $21.

St. Louis

ST. LOUIS, Dec. 1.

Pig Iron.—Buying of pig iron has been somewhat more limited during the past week, largely because of inability to get the iron as wanted, either as to quan-

(*Continued on page* 1156)

Pittsburgh

Pig Iron

The following quotations are all per gross ton at Valley furnaces, freight rate for delivery in the Cleveland and Pittsburg districts being $1.40 per ton.

Basic	$33.00
Bessemer	33.50
Gray forge	33.00
No. 2 foundry	32.50
No. 3 foundry	31.50
Malleable	33.00

Ferroalloys

We quote 78 to 82 per cent domestic ferromanganese $120 delivered, and English at $102 to $105, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote resale 50 per cent ferrosilicon at $80 to $82 and 18 to 22 per cent spiegeleisen at $33 to $35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $54.75; 10 per cent, $56.75; 11 per cent, $60.05; 12 per cent, $63.35. We quote 6 per cent silvery iron, $43.75; 7 per cent, $45.25; 8 per cent, $47.25; 9 per cent, $49.75, and 10 per cent, $51.75. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Billets and Sheet Bars

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $43 to $45; 2 x 2 in. billets at $45 to $47; slabs, $47 to $48; sheet bars, $45 to $47, and forging billets, $60 base, all f.o.b. at mill Pittsburgh or Youngstown.

Iron and Steel Bars

We quote steel bars rolled from billets at 2.75c. and from old steel rails, 2.45c. Pittsburgh mills rolling iron bars quote at 3.25c. Pittsburgh, plus full freight rate to point of delivery.

Structural Material

Beams and channels up to 15-in., 2.45c., Pittsburgh, large lots.

Plates

Sheared tank plates, ¼-in. and heavier, at 2.65c. to 2.75c. Pittsburgh, depending on order and delivery.

Spikes

We quote standard spikes, 9/16 x 4½ in., at $3.35 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅝ in., 7/16 in. and smaller, at $4.25 per 100 lb. in carload lots of 200 kegs of 200 lb. each, plus usual extras. Boat and barge spikes, $4.25 per 100 lb. in carload lots of 200 kegs of 200 lb. each, all f.o.b. Pittsburgh. For less than carloads 1c. per lb. higher is asked.

Cold Rolled Strip Steel

We quote cold rolled steel at $6.00 base per 100 lb. f.o.b. Pittsburgh, for 1½-in. and wider, 0.1000 in and thicker hard tempered in coils 0.20 carbon and under. Boxing charge, 25c. per 100 lb.

Old Material

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$23.00 to $24.00
No. 1 cast for steel plants	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	29.00 to 30.00
Compressed steel	18.00 to 19.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	17.00 to 18.00
Bundled steel stamping	15.00 to 15.50
No. 1 busheling	22.00 to 23.00
Railroad grate bars	20.50 to 21.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	26.00 to 26.50
Railroad malleable	22.00 to 23.00
Iron car axles	31.00 to 32.00
Locomotive axles, steel	31.00 to 32.00
Steel car axles	28.00 to 29.00
Railroad malleable	22.00 to 23.00
Cast iron wheels	25.50 to 26.00
Rolled steel wheels	24.00 to 25.00
Machine shop turnings	13.00 to 14.00
Sheet bar, crop ends (at origin)	26.00 to 27.00
Heavy breakable cast	21.50 to 21.75
Cast iron borings	17.00 to 17.50
No. 1 railroad wrought	23.00 to 24.00

Chicago

Pig Iron

The following quotations are for iron delivered at consumer's yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnaces and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average silicon 1.50, f.o.b. furnace, average freight to Chicago, $2.50 (other grades subject to usual differentials)	$40.00
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	37.50
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	35.00
Northern high phosphorus foundry	35.00
Southern coke, No. 1 foundry and No. 1 soft, silicon, 2.75 to 3.25	41.70
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	40.35
Southern foundry, silicon, 1.75 to 2.25	39.00
Malleable, not over 2.25 silicon	35.50
Basic	34.00
Low phosphorus (copper free)	40.00
Silvery, 7 per cent	49.15 to 51.80

Plates

The mill quotation is 2.65c. Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Structural Material

The mill quotation is 2.45c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote $3.47 for materials out of warehouse.

Ferroalloys

We quote 80 per cent ferromanganese at $120 delivered; 50 per cent ferrosilicon at $85 delivered; spiegeleisen, 18 to 22 per cent, $45 furnace.

Iron and Steel Bars

Mill prices are: Mild steel bars, 2.85c. to 3.25c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.77c. to 3c. Chicago; rail carbon, 3c. mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Cast Iron Pipe

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $65.80; 6-in. and above, $62.80; class A and gas pipe, $2 extra.

Bolts and Nuts

Jobbers quote: Structural rivets, 4.72c.; boiler rivets, 4.82c.; machine bolts up to ⅞ x 4 in., 35 and 5 per cent off; larger sizes, 25 and 5 off; carriage bolts up to ⅞ x 6 in., 30 off; larger sizes, 20 off; hot pressed nuts, square tapped and hexagon tapped, $1.45 off; coach or lag screws, gimlet points, square heads, 40 and 5 per cent off. Quantity extras are unchanged.

Sheets

Mill quotations are 4.35c. for No. 28 black, 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized.

Jobbers quote Chicago delivery out of stock; No. 10 blue annealed, 4.57c.; No. 28 black, 5.62c., and No. 28 galvanized, 6.97c.

Rails and Track Supplies

Standard railroad spikes, 3.35c. Pittsburgh. Track bolts with square nuts, 4.35c. Pittsburgh. Steel tie plates and iron angle bars, 2.75c. Pittsburgh and Chicago; tie plates, iron, 2.90c. f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Old Material

We quote delivery in buyer's yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$27.00 to $28.00
Relaying rails	40.00 to 50.00
Car wheels	30.00 to 31.00
Steel rails, rerolling	31.00 to 32.00
Steel rails less than 3 ft.	25.00 to 25.50
Heavy melting steel	20.50 to 21.50
Frogs, switches and guards, cut apart	20.50 to 21.50
Shoveling steel	20.50 to 21.00
Per Net Ton	
Iron angles and splice bars	$27.50 to $28.50
Steel angle bars	21.50 to 22.00
Iron arch bars and transoms	28.50 to 29.50
Iron car axles	33.50 to 34.50
Steel car axles	30.00 to 30.50
No. 1 busheling	18.50 to 19.00
No. 2 busheling	13.75 to 14.25
Cut forge	20.50 to 21.00
Pipes and flues	17.00 to 17.50
No. 1 railroad wrought	23.00 to 24.00
No. 2 railroad wrought	20.50 to 21.00
Steel knuckles and couplers	21.50 to 22.00
Coil springs	23.00 to 23.50
No. 1 cast	29.50 to 30.00
Boiler punchings	23.50 to 24.00
Locomotive tires, smooth	20.50 to 21.00
Machine shop turnings	10.50 to 11.00
Cast borings	11.50 to 12.50
Stove plate	24.50 to 25.50
Grate bars	25.25 to 26.25
Brake shoes	21.00 to 22.00
Railroad malleable	24.00 to 25.00
Agricultural malleable	24.00 to 25.00
Country mixed	16.50 to 17.50

Philadelphia

Pig Iron

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

Eastern Penn., No. 2X, 2.25 to 2.75 sil.	$38.10 to $40.10
Eastern Penna., No. 2 plain, 1.75 to 2.25 sil.	37.10 to 39.10
Virginia No. 2 X, 2.25 to 2.75 sil.	40.10 to 40.35
Virginia No. 2 plain, 1.75 to 2.25 sil.	39.10 to 40.10
Basic, delivered Eastern Penna.	32.00 to 35.00
Gray forge	36.10
Standard low phosphorus (f.o.b. furnace)	42.00
Malleable	36.00 to 37.00
Copper bearing low phosphorus (f.o.b. furnace)	37.00 to 38.00

Old Material

No. 1 heavy melting steel	$22.50 to $24.00
Steel rails, rerolling	31.00 to 32.00
No. 1 low phosphorus, heavy, 0.04 and under	27.00 to 28.00
Car wheels	30.00 to 31.00
No. 1 railroad wrought	30.00 to 31.00
No. 1 yard wrought	25.00 to 26.00
No. 1 forge fire	17.50 to 18.50
Bundled skeleton	17.50 to 18.50
No. 1 busheling	19.00 to 20.00
No. 2 busheling	16.50 to 17.50
Turnings (short shoveling grade for blast furnace use)	18.00 to 18.50
Mixed borings and turnings (for blast furnace use)	15.50 to 16.00
Machine shop turnings (for rolling mill and steel works use)	18.50 to 19.00
Heavy axle turnings (or equivalent)	19.00 to 20.00
Cast borings (for rolling mills)	21.00 to 22.00
Cast borings (for chemical plant use)	23.00 to 25.00
No. 1 cast	30.00 to 31.00
Railroad grate bars	24.00 to 25.00
Stove plate	22.50 to 23.50
Railroad malleable	23.00 to 24.00
Wrought iron and soft steel pipes and tubes (new specifications)	21.00 to 22.00
Ungraded pipe	17.00 to 18.00

Birmingham

Pig Iron

Foundry, silicon 1.75 to 2.25	$34.00 to $35.00
Basic	33.00 to 34.00

Old Material

Steel rails	$20.00 to $21.00
No. 1 heavy steel	19.00 to 20.00
Cast iron borings	14.00 to 15.00
Machine shop turnings	14.00 to 15.00
Stove plate	22.00 to 23.00
No. 1 cast	24.00 to 25.00
Car wheels	24.00 to 25.00
Tramcar wheels	23.00 to 24.00
Steel axles	26.00 to 27.00
No. 1 wrought	21.00 to 22.00

Buffalo

Pig Iron

No. 1 foundry, 2.75 to 3.25 silicon	$41.00
No. 2 X, 2.25 to 2.75 silicon	39.25
No. 2 plain foundry, 1.75 to 2.25 silicon	38.00
Malleable, silicon not over 2.25	39.25
Basic	36 00
Lake Superior charcoal, regular grades, f.o.b. Buffalo	38.40

Old Material

Heavy melting steel, regular grades	$23.00 to $23.50
Low phosphorus, 0.04 and under	27.00 to 28.00
No. 1 railroad wrought	25.00 to 26.00
No. 1 machinery cast	29.00 to 29.50
Iron axles	33.00 to 34.00
Steel axles	33.00 to 36.00
Car wheels	26.50 to 27.50
Railroad malleable	23.00 to 24.00
Machine shop turnings	13.50 to 14.00
Heavy axle turnings	18.50 to 19.50
Clean cast borings	19.00 to 20.00
Iron rails	28.00 to 29.00
Locomotive grate bars	22.00 to 22.50
Stove plate	23.00 to 23.50
Wrought pipe	18.50 to 19.00
No. 1 busheling	20.00 to 21.00
Bundled sheet stamping	16.00 to 17.00

New York

Pig Iron

No. 1 foundry, silicon 2.75 to 3.25	$40.80
No. 2 X, silicon 2.25 to 2.75	39.80
No. 2 plain, silicon 1.75 to 2.25	38.80
No. 2 X, Virginia, silicon 2.25 to 2.75	41.65

Finished Iron and Steel

We quote as follows for mill shipments: Bar iron, refined grade, 3.27c.; soft steel bars, 3.12c.; shapes, 2.72c.; plates, 2.92c.; all New York.

Old Material

Heavy melting steel	$18.00 to $18.50
Rerolling rails	27.00 to 28.00
Relaying rails, nominal	45.00 to 46.00
Steel car axles	27.00 to 28.00
Iron car axles	38.00 to 39.00
No. 1 railroad wrought	27.00 to 27.50
Wrought iron track	20.00 to 20.50
Forge fire	14.50 to 15.00
No. 1 yard wrought, long	20.50 to 21.00
Light iron	6.00 to 7.00
Cast borings (clean)	17.00 to 17.50
Machine shop turnings	14.00 to 14.50
Mixed borings and turnings	13.00 to 13.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	18.00 to 18.50
Stove plate	20.00 to 20.50
Locomotive grate bars	22.50 to 23.00
Malleable cast (railroad)	22.50 to 23.00
Old carwheels	27.00 to 28.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	30.00 to 31.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	29.00 to 30.00
No. 1 heavy cast, not cupola size	21.00 to 22.00
No. 2 (radiators, cast boilers, etc.)	20.00 to 21.00

Cleveland

Iron Ore

Old range Bessemer, $6.45; old range non-Bessemer $5.70; Mesaba Bessemer, $6.20; Mesaba non-Bessemer, $5.55

Pig Iron

Basic	$33.40
Northern No. 2 foundry, silicon, 1.75 to 2.25	34.40
Southern foundry, silicon, 2.25 to 2.75	40.35
Gray forge	33.40
Ohio silvery, silicon, 8 per cent	52.40
Standard low phos., Valley furnace	$38.00 to 40.00

Finished Iron and Steel

Steel bars, 3.25c.; plates, 3.57c.; structural shapes, 3.37c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.27c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Old Material

Heavy melting steel	$20.75 to $21.25
Steel rails, under 3 ft.	25.00 to 26.00
Steel rails, re-rolling	29.00 to 30.00
Iron rails	29.00 to 30.00
Iron car axles	35.00 to 36.00
Steel car axles	33.00 to 34.00
Low phosphorus melting scrap	22.50
Cast borings	16.00 to 16.50
Iron and steel turnings and drillings	13.50 to 14.00
Short turnings (for blast furnaces)	14.00 to 14.50
Compressed steel	17.75 to 18.00
No. 1 railroad wrought	22.00 to 23.00
Railroad malleable	24.00 to 25.00
Agricultural malleable	20.00 to 21.00
Steel axle turnings	17.00 to 17.50
Light bundled sheet scrap	14.50 to 15.00
No. 1 cast	28.00 to 29.00
No. 1 busheling	20.00 to 21.00
Drop forge flashings, 10 in. and under	18.50 to 19.50
Drop forge flashings, over 10 in.	16.50 to 17.00
Railroad grate bars	22.00 to 24.00
Stove plate	33.00 to 24.00

Cincinnati

Pig Iron

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, silicon 1.75 to 2.25 (base price)	$37.60 to $38.60
Southern coke, silicon 2.25 to 2.75 (No. 2 soft)	38.00
Ohio silvery, 8 per cent silicon	51.80
Southern Ohio coke, silicon 1.75 to 2.25 No. 2)	37.55 to 38.55
Basic, Northern	36.05
Standard Southern car wheel	48.60
Malleable	38.05 to 39.05

Old Material

Per Gross Ton

Bundled sheet	$13.50 to $14.00
Old iron rails	23.50 to 24.00
Relaying rails, 50 lb. and up	41.00 to 42.00
Rerolling steel rails	22.00 to 22.50
Heavy melting steel	16.00 to 17.00
Steel rails for melting	17.50 to 18.00
Old car wheels	19.00 to 19.50
No. 1 railroad wrought	19.00 to 19.50

Per Net Ton

Cast borings	$8.50 to $9.00
Steel turnings	8.00 to 8.25
Railroad cast	21.00 to 21.50
No. 1 machinery	23.00 to 23.50
Burnt scrap	14.00 to 15.00
Iron axles	25.00 to 25.50
Locomotive tires (smooth inside)	19.50 to 20.00
Pipes and flues	15.00 to 15.50
Malleable cast	16.50 to 17.00
Railroad tank and sheet	14.00 to 14.50

St. Louis

Old Material

Per Gross Ton

Old iron rails	$27.50 to $28.00
Old steel rails, rerolling	32.00 to 32.50
Old steel rails, less than 3 ft.	25.00 to 25.50
Relaying rails, standard sections, subject to inspection	38.00 to 45.00
Old car wheels	26.00 to 26.50
No. 1 railroad heavy melting steel	21.50 to 22.00
Heavy shoveling steel	20.50 to 21.00
Ordinary shoveling steel	19.50 to 20.00
Frogs, switches and guards, cut apart	21.50 to 22.00
Ordinary bundled sheets	13.00 to 13.50
Heavy axle and tire turnings	15.50 to 16.00

Per Net Ton

Iron angle bars	$24.00 to $24.50
Steel angle bars	21.00 to 21.50
Iron car axles	32.50 to 33.00
Steel car axles	32.00 to 32.50
Wrought arch bars and transoms	27.00 to 27.50
No. 1 railroad wrought	23.00 to 23.50
No. 2 railroad wrought	22.00 to 22.50
Railroad springs	21.00 to 21.50
Steel couplers and knuckles	21.00 to 21.50
Locomotive tires, 42 in. and over, smooth inside	21.00 to 21.50
No. 1 dealers' forge	20.50 to 21.00
Cast iron borings	11.50 to 12.00
No. 1 busheling	20.50 to 21.00
No. 1 boiler, cut to sheets and rings	17.00 to 17.50
No. 1 railroad cast	27.50 to 28.00
Stove plate and light cast	24.50 to 25.00
Railroad malleable	21.50 to 22.00
Agricultural malleable	20.50 to 21.00
Pipes and flues	18.50 to 19.00
Heavy railroad sheet and tank	17.00 to 17.50
Machine shop turnings	12.00 to 12.50
Country mixed	17.00 to 17.50
Uncut railroad mixed	18.50 to 19.00
Horseshoes	22.00 to 22.50

Boston

Pig Iron

Eastern Pa., No. 2X silicon 2.25 to 2.75	$39.90 to $40.15
Eastern Pa., No. 2 plain silicon 1.75 to 2.25	38.90 to 39.15
Buffalo No. 2 X silicon 2.25 to 2.75	38.90 to 39.15
Buffalo No. 2 plain silicon 1.75 to 2.25	37.90 to 38.15
Virginia No. 2 X silicon 2.25 to 2.75	39.95 to 40.95
Virginia No. 2 plain silicon 1.75 to 2.25	38.70 to 39.70
Alabama No. 2 plain silicon 1.75 to 2.25	39.00 to 40.00
Alabama silicon 2.25 to 2.75	41.00 to 43.00

Old Material

No. 1 heavy melting steel	$17.00 to $18.00
No. 1 railroad wrought	25.50 to 26.00
No. 1 yard wrought	22.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	17.00 to 18.00
Machine-shop turnings	13.50 to 14.00
Cast iron borings	16.00 to 17.50
Heavy axle turnings	15.50 to 16.00
Blast furnace borings and turnings	12.50 to 13.00
Forge scrap	13.50 to 14.00
Bundled skeleton	13.50 to 14.50
Steel car axles	27.00 to 28.00
Car wheels	28.00 to 29.00
Machinery cast	32.00 to 33.00
No. 2 cast	29.00 to 30.00
Stove plate	21.00 to 22.00
Railroad malleable	20.00
Rerolling rails	27.50 to 28.50

Tool Steel

Jobbers quote: Ordinary tool steel, 16c. per lb. base; extra, 19c. base; special, 24c. base; double special, 66c. base; non-changeable, 36c. base; high speed steel, $1.50 base. Mill shipments are quoted at 1c. per lb. less.

Warehouse Prices

Jobbers quote: Steel bars, cold rolled rounds, $5 per 100 lb. base; squares, hexagons, flats, $5.50 base; soft steel, flats, rounds, squares, $3.55 to $3.65 base; structural steel, $3.55 to $3.65; tire steel, $4.25 to $4.50; spring steel, open hearth, $8; special, $12; toe calk steel, $5.50; steel hoops, $5 to $5.25; steel bands, $4.75 to $4.85; best iron flats, rounds and squares, $5.50 base; refined iron, $3.65 to $3.75; No. 10 blue annealed sheets $5.10; No. 28 black sheets, $7.15; No. 28 galvanized sheets, $8.50; plates, $3.95

IRON AND STEEL MARKETS

(*Continued from page* 1153)

tities or deliveries. However, the actual transactions ran up to 5000 tons, perhaps, aside from about 10,000 tons of Northern basic bought by the Scullin Steel Co. It is reported that tonnage is all the company has been able to get so far on its inquiry for 30,000 put out early last week. Foundries in general are operating up to capacity, but are fearful of the developments of the coal strike in its effect on fuel supplies.

Boston

BOSTON, Dec. 2.

Pig Iron.—The outstanding feature of the market during the past week has been the activity of Virginia irons, several thousand tons having been sold for spot, first quarter and first half delivery. Most of the iron sold was silicon 2.25 to 2.75 and higher, the furnaces not being especially anxious to take orders for silicon 1.75 to 2.25. The market on Virginia iron is on a $35 furnace base with Government differentials, but leading sellers have withdrawn from the 1920 market. A considerable tonnage of Eastern Pennsylvania iron also has been sold since last reports. The sales include 300 tons to a Worcester foundry, silicon 2.25 to 2.75 at $36.75 furnace; 200 tons to an eastern Massachusetts consumer at $37 furnace; 400 tons to a western Massachusetts consumer at the same price; 700 tons at $38, all first half deliveries. Comparatively little Buffalo iron has sold, the available supply being very small. Operating costs and freights have tended to restrict business in Alabama irons. The Draper Co., Hopedale, Mass., is in the market for a considerable tonnage of silicon 3.00 to 3.50 for 1920 shipment.

Coke.—The New England Coal & Coke Co.'s December sliding scale contract price is $7 Connellsville base; its spot shipments are on a $7.50 Connellsville base, and its flat contract price, first half 1920 delivery, on a $7.50 basis.

Warehouse Business.—Some of the local warehouses report a slightly freer movement of iron and steel from the mills, but that receipts are still far below actual needs and local stocks, therefore, continue badly broken.

Old Material.—Further large sales of old material are reported and prices are considerably higher than they were a week ago. Three hundred tons of cast scrap, first quarter delivery, have sold at $33 delivered.

Birmingham

BIRMINGHAM, ALA., Dec. 1.

Pig Iron.—On the last business day of the month of November, one Birmingham furnace interest, which had during the week sold a large tonnage for 1920 delivery at $33 and a few lots at $34, raised the price to $35. All other interests were on the eve of doing the same thing. The recent business has been widespread, embracing practically every kind of pig iron consumer. Books were opened at $34 on Nov. 28, and in a short time a large tonnage was booked. Saturday bookings were also large. Thousand-ton lots were frequent. Consumers are realizing the shortage. There are less than 100,000 tons of foundry in Alabama yards and most of that belongs to consumers. The total of all kinds of iron is less than 150,000 tons. Car service has improved, one interest shipping more than its make in November and all catching up. It was agreed at the close of the month that, provided the coal and coke situation remained as it was, two banked stacks at least would resume during the week and possibly two others.

Old Material.—Scrap has been active and steel has moved in large quantities for the first time in several months in response to mill activities and the depletion of stocks on consumers' yards. The scrap dealers made good by holding off their accumulations when steel prices were lower.

BRITISH STEEL WORKS STOPPED

Result of the Transportation Chaos—Some Higher Prices—Demand from Germany and Austria

LONDON, ENGLAND, Dec. 1.—(*By Cable*).—The dislocation at steel works owing to the railroad situation is increasing. The Cargo Fleet and the Dorman-Long mills have stopped. The molders' strike continues.

Prices are very irregular. No. 1 foundry pig iron at Cleveland has advanced 3s 6d to 167s 6d per ton ($33.50 with exchange at $4 for £1). Billets and sheet bars are now quoted at £15 10s to £16 ($62 to $64) and steel bars are quoted at £20 15s to £21 15s ($83 to $87).

The demand for tin plate is a trifle less urgent but important quantities are still required for early shipment. Transport conditions in Wales are causing intense inconvenience. Prices remain at 45s 6d to 46s per base box ($9.10 to $9.20). Meetings are to be held between tin plate makers and the railroads and the Government to discuss the situation.

Black plates presumably for tinning are in great demand with Germany and Austria among those in the market. Prices are 35s for rectangles and 47s for circles.

Galvanized sheets are in strong demand in all markets and £39 ($156) f. o. b. has been paid for No. 24 gage.

San Francisco

SAN FRANCISCO, Nov. 25.

After ten days' time spent in registering the men who desired to return to work, the shipyards of the bay district opened for a resumption of business on Nov. 24. The claim was made that over 11,000 men registered, but scarcely half of that number appeared the first day. It is too early to judge of the success of the experiment. The yards are running, but as yet none of the machine shops or foundries has attempted to open. It is planned to run on the open shop basis.

There is local inquiry for pig iron, which local dealers say there is little prospect of filling until the Eastern market becomes easier.

Youngstown Mills Follow Conservative Policy

YOUNGSTOWN, OHIO, Dec. 2.—Uncertainty over the coal situation is deterring steel producers in this district from obligating themselves for a longer period than the first quarter in practically all finished lines. Just as the labor situation became normal, the coal strike threatens to impede schedules and close many departments.

Sheet makers are booked over the initial quarter in all cases and do not show a disposition, under present operating conditions, to take on more business. Inquiries for light-gage, blue annealed and galvanized continue to come into the Valley, despite the fact that order books are clogged.

The same condition applies to the unfinished market. In face of a rising market, producers hesitate to book additional tonnages. The prevailing price for sheet bars is $45, although sales have been made slightly in excess of this figure and slightly below.

Pig iron prices continue nominal. One sale of Bessemer pig was recently made for $34 furnace.

Fabricators and the building trades are in the market for practically all finished material, but the labor situation is still a deterrent. Inquiries for pipe have come into the Valley in volume in the past week with resumption of pipe departments by the leading makers.

Beginning Dec. 1, the American Iron Products Co., 107 Liberty Street, New York, will have operating its non-ferrous department to handle direct the brass and copper business heretofore originating through its branch offices in foreign countries but diverted through another company specializing in brass and copper.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Nov.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
26	19.50	19.00	54.37½	6.75	6.55	8.25	7.90
27	....	....	....	....	....	....	....
28	19.25	18.75	54.00	6.75	6.55	8.30	7.95
29	19.00	18.50	....	6.75	6.55	8.35	8.00
Dec.							
1	18.75	18.25	54.00	6.75	6.55	8.45	8.10
2	18.75	18.25	54.00	6.75	6.55	8.45	8.10

New York

Lack of buying continues a feature of the copper market. Values have continued to fall so that electrolytic copper can be bought at an average price of 18.25c., New York, for December delivery, at which level or a little lower the small amount of business offering has been actively sought. Lake copper is nominal at around 18.75c. to 19c., New York. Production continues in considerable excess of consumption and unless there is a radical change for the better very soon producers may be obliged to curtail output. Very little is heard of export demand. The tin market has been quiet except on one day the middle of last week when sales aggregated close to 1000 tons, the largest in many months. These comprised future shipments from the East for November, December, January and February at 54.12½c. to 54.50c. The spot market is quiet at 54c., New York, for Straits tin. Tin deliveries for November were 6665 tons, which was considerably less than the trade expected. Tin in stocks and landing Nov. 30 was 4955 tons, still a large amount. The lead market has been quiet and steady with very little business reported. Prices continue unchanged at 6.75c., New York, and 6.55c., St. Louis. Producers generally have not much to sell but seem more disposed to meet the market. The zinc market is quiet and strong at 8.10c., St. Louis, and 8.45c., New York, for prime Western for early delivery. This situation is due to the higher market in London and a fairly good export demand. Prospects for domestic business are only fair. Antimony in wholesale lots can be obtained at 9.25c., New York, duty paid for early delivery, with virgin aluminum quoted at 32c. to 33c., New York.

Copper Averages.—The average price of Lake copper for November, based on daily quotations in THE IRON AGE, was 20.69c. The average price of electrolytic was 20.17c.

Old Metals.—The market generally is lower in sympathy with the new metal prices but business is practically at a standstill as dealers will not sell at the new level. Dealers' selling prices are reported as follows:

	Cents per lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	16.00
Brass, heavy	13.00
Brass, light	9.00
Heavy machine composition	18.00
No. 1 yellow rod brass turnings	11.00
No. 1 red brass or composition turnings	15.00
Lead, heavy	6.00
Lead, tea	4.50
Zinc	5.50

The London *Ironmonger* summarizes an article in a French journal which says in reference to French and English business methods in Germany, that when France bought a quantity of German hardware, mostly cutlery, the French Syndical Chambers protested, and the purchases ceased. England, on the other hand, has a Cutlery Commission at Cologne, composed of experts from Sheffield, who are endeavoring to get the control of the most important works at Solingen. France will thus continue to buy razors and cutlery from Solingen, but they will pass through British intermediaries instead of coming direct.

More Plants Close in Chicago District

CHICAGO, Dec. 1.—The bar iron mills of the Republic Iron & Steel Co. and the Interstate Iron & Steel Co. at East Chicago, Ind., were closed Saturday after exhausting their coal supplies, but the latter resumed today. Other merchant iron mills previously shut down include the Highland Iron & Steel Co. plants at West Pullman, Ill., and Terre Haute, Ind., the Riverdale Iron & Steel Co. mill, Riverdale, Ill., and the National Rolling Mill Co., Vincennes, Ind. The Moline, Ill., rail carbon bar mill of the Republic Iron & Steel Co. has also suspended operations. The hard steel bar plant of the Calumet Steel Co., Chicago Heights, Ill., is still running, but will soon exhaust its supply of fuel. The Sellers Mfg. Co., manufacturer of iron tie plates and angle bars, Chicago, still has about one week's supply of coal. The Grand Crossing wire works and the South Chicago steel plant of the Interstate Iron and Steel Co. also continue to operate with small reserves of fuel. The Illinois Steel Co., the Inland Steel Co. and the Steel & Tube Co. of America will not exhaust their stocks of fuel for several weeks. The Inland company, however, has been forced to use coking coal for steam and gas purposes and the other two large interests will probably have to do likewise soon, if there is no improvement in coal production.

Government restrictions on the distribution of coal are steadily becoming more rigid and the latest regulations applying to dealers also govern coke distribution.

New Italian Plant for Smelting Iron Ores Electrically

The Ansaldo Co. has started up its new 20-ton electric furnaces for smelting iron ore at its new works at Cogne, Val d'Aosta, in the northwestern corner of Italy, adjacent to the French and Swiss frontiers, according to U. S. Commercial Attaché Alfred P. Dennis of Rome. Considerable deposits of iron ore have been found which in quality rank with the best Swedish ore. Falling water capable of developing 80,000 hp. of electrical energy is near at hand. The Ansaldo Co., which undertook to develop the Italian ore deposits, after three years of preparation and the expenditure of an enormous sum has actually begun to smelt iron ores in electric furnaces.

It is a question whether the venture will be successful, continues the report. Can Italy turn out iron and steel in electric furnaces as cheaply as it can buy the material from Germany and the United States? An expert estimates that the cost of hydroelectric energy in the form of continuous current working 24 hr. per day and 365 days in the year must be held down to $9 per hp.-yr. to assure commercial success to electric smelting. Before the war the cheapest hydroelectric plant in the world was at Trondhjem, Norway, with an annual horsepower cost of $6. In Italy hydroelectric undertakings rarely run under $100 per hp. for installation, which gives an interest charge of $6 to start with; adding to this $2 for amortization and $3 for overhead, we get $11 as cost per horsepower-year.

It is stated on good authority that German pig iron is now being offered for Italian delivery at 40 per cent less than the cost at the new Ansaldo works.

May Regulate Production of Coke

WASHINGTON, Dec. 1.—Because of the increase in the production of beehive coke, despite the coal and steel strikes, Fuel Administrator Garfield has formally given Director General Hines of the Railroad Administration the power "to make such rules, regulations and orders restricting or prohibiting the use or consumption of bituminous coal for the purpose of producing or manufacturing coke in beehive ovens as may from time to time be necessary." At the office of Director General Hines, however, it was declared that this power would not be used unless necessary, and that it had been secured only to meet any emergency that might arise. At the same time the Railroad Administration was also given complete control over all coal in barges, scows and ships, just as though it were in cars of the Railroad Administration.

PERSONAL

F. S. EASTERLY, for several years secretary, Stalnaker Steel Co., Pittsburgh, dealer in scrap, who resigned sometime ago, has been appointed Pittsburgh representative of the Hyman-Michaels Co., large scrap dealer, having offices and yards in Chicago, St. Louis and East Chicago, Ill. Mr. Easterly has his office in room 1103 First National Bank Building, Pittsburgh.

W. E. Seymour, general superintendent Beloit, Wis., plant, Fairbanks, Morse & Co., has been elected vice-president and general manager of the A. O. Smith Co., automobile manufacturer, Milwaukee, Wis. He is succeeded at Beloit by W. C. Heath, assistant general superintendent.

Wilford L. Stork has become foundry superintendent of the Detroit Valve & Fitting Co., Wyandotte, Mich., having formerly been metallurgist of the Michigan Motor Casting Co., Buick division, Flint, Mich.

William H. Hazard, formerly designing mechanical engineer Hercules Powder Co., has become industrial engineer for the General Motors Corporation at the Janesville Machine Co. and Samson Tractor Co. plants.

C. R. Hubbard has left the National Metal Molding Co., Ambridge, Pa., where he was designing engineer, to take up industrial engineering work with the Revere Rubber Co., Providence, R. I.

Francis J. McGrail has taken the superintendency of the iron and brass foundries operated by the Honolulu Iron Works Co., Hawaii. He was formerly with Henry R. Worthington Pump Co., Harrison, N. J.

A. L. Valentine, superintendent of the small tool department of Pratt & Whitney Co., Hartford, Conn., has become works manager of the Société des Usines Curial, Paris, manufacturer of small tools.

William T. Clark has left the Moline Plow Co., Moline, Ill., to become factory manager of Fuller & Sons Mfg. Co., Kalamazoo, Mich.

E. W. Thompson, who for the past eleven years has represented the Standard Tool Co. in Illinois, has joined the sales force of the Davidson Tool Mfg. Corporation and will represent it in the Chicago territory

Alfred L. Fitch, formerly designer with the Blanchard Machine Co., Cambridge, Mass., has become mechanical engineer with the Ashton Valve Co., Cambridge.

F. B. Williams has become assistant superintendent of the Watertown, Mass., plant of the Walker & Pratt Mfg. Co., house heating boilers. He was previously captain in the Ordnance Department.

Otto R. Kihm has formed the Kihm-Bowen Machine Co., Irvington, N. J., specializing in sheet metal working machinery, shear blades and regrinding shear blades. He was formerly mechanical engineer with the American Can Co., Edgewater, N. J.

Walter W. Tangeman has again joined the Cincinnati Milling Machine Co., Cincinnati, as sales engineer after service in France as major in the Ordnance Department.

R. R. Shafter will have charge of the New York sales office of the Traylor Engineering & Mfg. Co., after two years as general superintendent of the Traylor Shipbuilding Corporation.

The Hazard Mfg. Co., Wilkes-Barre, Pa., has placed William S. Hart in charge of its Chicago sales office and warehouse, with the title of district manager, effective Oct. 1. Albert W. Gabriel, who has been district manager for a number of years, has resigned to embark in another line of business. Mr. Hart was for several years assistant district manager of the Hazard company's branch, and during the last two years has been assistant general superintendent at the factory.

Sven Anderson, general manager of the Bethlehem Shipbuilding Corporation, Sparrows Point, Md., has resigned. He had been with the company for 20 years and felt in need of a rest. George Hetherton, also associated with the corporation for 20 years, who had been serving as assistant general manager, was promoted to Mr. Anderson's place.

Samuel J. Goodkin has disposed of his interests in the Whitehall Engineering & Machine Co., Inc., Whitehall, N. Y.

Richard Martens, director-in-chief of R. Martens & Co., Inc., New York, has resigned from this firm, which he organized in 1908 and with which Lord Rhondda, afterward British Food Controller, became connected in 1913. Mr. Martens has been active in developing interest in trade opportunities between the United States and Russia, and he will hereafter devote his entire effort in that direction. In coöperation with a number of American manufacturers and bankers he has plans under consideration for putting into Siberia and the southern part of Russia the necessary tools and machinery to restore agricultural industry as quickly as possible. Mr. Martens' address will remain as at present, 6 Hanover Street, New York.

William S. Boyd, for several years purchasing agent Page Steel & Wire Co., Monessen, Pa., has resigned to become manager of the iron and steel scrap department of the Thomas D. Prosser Co., and will have his headquarters in its main offices at Wooster, Ohio.

Walter C. Mack has been elected president of the Hoover Steel Ball Co., Ann Arbor, Mich. The other officers are: Frank Stivers, vice-president; H. D. Runciman, secretary, and M. Fritz, treasurer. The directors include the officers and William Arnold, Jr., R. T. Dobson, H. W. Douglas, Dr. L. P. Hall and Dan F. Zimmerman.

Joseph B. Bond, a director of the Charles Bond Co., 617 Arch Street, Philadelphia, manufacturer of power transmission equipment, mill supplies, etc., has located permanently at Toronto, Canada, to care for the interests of the Bond Engineering Works, Ltd., an affiliated organization.

F. W. Sinram, president American Gear Manufacturers' Association, was elected president of the Van Dorn & Dutton Co., gear specialists, Cleveland, at the last meeting of the board of directors of that company. Franklin Schneider was elected vice-president at the same meeting. Mr. Schneider is also president of the Van Dorn Electric Tool Co., of which Mr. Sinram is treasurer.

Tracy F. Manville, for a number of years district manager of sales for the Columbia Steel & Shafting Co. in New York, has been appointed general manager of sales and on December 1 took up his new duties at the main office of the company in Pittsburgh. Edward T. Corbus has been appointed district manager of sales in New York as successor to Mr. Manville.

George E. A. Fairley, formerly assistant chief engineer of the Electrical Commission, Baltimore, has accepted a position on the electrical engineering staff of the Bethlehem Steel Co. During the war Mr. Fairley served as a major in command of the 511th Engineers in France.

Francis J. Reilly, recently with the Government Aircraft Production Board and formerly associated with *Machinery and Railway Mechanical Engineer*, New York, and before that with the Brown & Sharpe Mfg. Co., Providence, R. I., has become a member of the publicity department of the Norton Co., Worcester, Mass.

Roger P. Redier, general sales manager for Europe for the Allied Machinery Co. of America, is in New York for a short visit at the main office of the company.

Quincy Bent, vice-president Bethlehem Steel Co., last week inspected the plant of the company at Sparrows Point, Md. He was accompanied on his tour of inspection by W. F. Roberts, general manager of the plant, and R. K. Weiser, assistant general manager.

Alexander C. Brown, president Brown Hoisting Machinery Co., Cleveland, has been elected president of the Northeastern Ohio Division of the National

Safety Council. As chairman of the finance committee of the Ohio division of the council, Mr. Brown was very active in the preparations for the eighth annual congress held at Cleveland recently.

Richard Muse, for more than 30 years with the Marshall Foundry Co., Pittsburgh, manufacturer of ingot molds and heavy castings, now owned by the Valley Mold & Iron Corporation, Sharpsville, Pa., and for 24 years general superintendent of its foundry in Pittsburgh, has resigned.

L. E. Bixler, purchasing agent for the United States Metal Goods Co., Cleveland, manufacturer of automobile parts and replacement parts for Ford cars, also formerly purchasing agent for Service Motor Supply Co., has resigned his position to take one with Packers' Machinery & Equipment Co., Chicago.

A. H. Hudson, who was purchasing agent from the time of organization until recent date of the American International Steel Corporation, New York, is now manager of purchases of the Isko Co., Chicago, manufacturer of electric refrigerating machines.

Arthur B. Mead, for several years a member of the New York sales organization of Peter A. Frasse & Co., Inc., New York, tubing, steel, tools and supplies, has been appointed district sales manager for central Pennsylvania, southern New Jersey, Virginia, Delaware and Maryland, with his headquarters at 625 Arch street, Philadelphia.

J. A. Tarkington, for 13 years general superintendent and consulting engineer Kissel Motor Car Co., Hartford, Wis., has resigned, effective January 1, to become general manager of the Tarkington Motor Car Co., Rockford, Ill., organized by leading business men of Rockford to engage in the manufacture of a passenger automobile designed by Mr. Tarkington, which will bear his name. Work on the erection of the first unit of a new plant is under way. It will be 64 x 500 ft. and ready about March 15.

C. G. Ugglas has resigned from the engineering department of the Youngstown Sheet & Tube Co., Youngstown, Ohio, to become assistant chief engineer of the Cleveland Machine & Mfg. Co., Cleveland.

A. A. Corey has been appointed to succeed William H. Haywood, who resigned fr m the sales department of the Youngstown Sheet & Tube Co. to become officially identified with the Youngstown Boiler & Tank Co., Youngstown, Ohio.

OBITUARY

JOHN F. BARKER, former president Gilbert & Barker Mfg. Co., Springfield, Mass., died recently. He went to Springfield in 1862 and was employed at the Water Shops of the United States Armory, where he remained until the founding of the Gilbert & Barker Mfg. Co. in 1865. He was treasurer and manager of the company until 1884, when he was elected president, which position he held until his retirement in 1911.

WILLIAM H. FIELD, 54 Columbia Road, Dorchester, Boston, died suddenly Nov. 14 at the William H. Field Co. plant in Boston. Mr. Field was born in Waltham, Mass., June 26, 1858, the son of William F. Field, who established the wood-working machinery business later carried on by his son.

JOHN H. CLAUSS, Fremont, Ohio, organizer and for many years head of the Clauss Shear Co. of that city, died Nov. 20 aged 64.

FRANK B. MONTGOMERY, traffic manager International Harvester Co. and of its subsidiary, the Wisconsin Steel Co., Chicago, died at his home in that city on Nov. 24.

JOHN F. CORCORAN, head of the Baltimore Galvanizing Works, Baltimore, died Nov. 27 at his home in that city, aged 60, from a complication of diseases following a stroke of paralysis.

OFFICE CHANGES

The Interstate Iron & teel Co., 104 South Michigan Avenue, Chicago, has opened an office in Milwaukee in the First Wisconsin National Bank Building, telephone Broadway 5369. This office is in charge of Arthur R. Jones, assisted by Charles Belik, both formerly of the general office of the same company in Chicago.

The Interstate Iron & Steel Co., 104 South Michigan Avenue, Chicago, has appointed The Certes Supply Co., St. Louis, sales representative in that territory.

The Booth-Hall Co., 326 Madison Street, Chicago, has moved to 53 West Jackson Boulevard.

The name of the United States Column Co., Cambridge, Mass., manufacturer of columns, caps and bases has been changed to the Lally Column Co.

The Morton Machinery Co., Philadelphia is now located at 139 North Third Street in larger quarters.

The Atlantic Steel Co., Atlanta, Ga., announces the removal of its New York office to 120 Liberty Street, where it is represented by Baird-Martin, Inc.

Neilson & Maxwell, Inc., a branch of the Glasgow, Scotland, house of the same name, has opened a New York office at 136 Liberty Street in charge of F. J. Gilchrist.

The Lyon Metallic Mfg. Co., Aurora, Ill., manufacturer of steel shelving, lockers, boxes, cabinets and general steel equipment, announces the opening of a New England district sales branch in Boston. J. B. Throckmorton, who represented the Lyon Metallic Co. in New York for a number of years, is in charge, with offices at 161 Devonshire Street.

The general offices of the Slick-Knox Co., Pittsburgh, works at Wheatland, Pa., are now located on sixth floor, space 1, in the Chamber of Commerce Building, Pittsburgh. The executive and selling departments of the company are in these offices.

The Youngstown Wire & Iron Co. has been organized at Youngstown, Ohio, with a capital of $25,000.

Bethlehem Fabricators, Inc., Bethlehem, Pa., have opened an office in Room 1106, 505 Fifth Avenue.

The Leland-Gifford Co., Worcester, Mass., manufacturer of high-grade sensitive drilling machines and profiling machines, announces the opening of a sales office at 521 Chamber of Commerce Building, Rochester, N. Y., in charge of A. H. Anderson. This company has also recently transferred its Chicago office from 500 Machinery Hall to 621 West Washington Boulevard, where it has a store and demonstrating room. C. H. James is in charge of the store and O. H. Leidy has recently been added to the Chicago sales force. The company intends to keep a stock there for immediate delivery.

The National Wire Wheel Co. has removed its accounting offices from Detroit to Hagerstown, Md., where the plant is located. D. L. Davis, who has been in charge at Detroit, has moved his headquarters to Hagerstown.

The Warner & Swasey Co., machine tool manufacturer, Cleveland, has established branch offices at Indianapolis, St. Louis and St. Paul and Minneapolis. C. W. Potts has been appointed representative at St. Louis, with offices at the Railway Exchange Building. Gerald Kochenderfer is the Indianapolis representative, with headquarters at 3043 North Pennsylvania Avenue, and J. R. Dulin is the representative in the Twin Cities.

The C. Dreifus Co., Oliver Building, Pittsburgh, large dealer in iron and steel scrap, has opened a branch sales office in room 1128 Guardian Trust Building, Cleveland, in charge of A. R. Derbaum, who has been connected with sales in the Pittsburgh office for several years.

Machinery Markets and News of the Works

LARGE BUYING IN EAST

Orders Aggregating $1,500,000 Placed by Two Automotive Companies

General Demand for Machine Tools Continues Strong in All Markets—New Departure Mfg. Co. Buys 400 to 500 Tools.

Greater activity among the automotive manufacturing companies of the East has produced a large amount of machine-tool business in the past week. The New Departure Mfg. Co., Bristol, Pa., bought 400 to 500 tools, aggregating in value close to $1,000,000, for plant extensions, and the Willys Corporation bought about $500,000 worth of equipment, mostly special machines, for its new plant at Elizabeth, N. J. The H. H. Franklin Mfg. Co., Syracuse, N. Y., is in the market for a considerable quantity of equipment, and the requirements of the Stevens-Duryea Co. for its plant at Chicopee, Mass., will be made known in a few weeks. The Rolls-Royce Co. is getting settled in its recently acquired plant at Springfield, Mass., and will probably buy equipment soon.

Other business has been in good volume. The Standard Oil Co. of New Jersey has placed orders aggregating $150,000 for equipment to be shipped to Rumania. The Liberty Starters Co., Poughkeepsie, N. Y., is buying on a list of nearly 100 tools recently issued. Other companies that are in the market for equipment are the General Electric Co., which will increase its output of small motors in a new plant at Decatur, Ind.; the Western Electric Co., which will buy for its Hawthorne, Ill., plant; the American Car & Foundry Co., which has a new list out; the American Locomotive Co., which will buy new equipment for its Montreal works; the Worthington Pump & Machinery Corporation and C. H. Johannson, Inc., Poughkeepsie, N. Y.

Railroad business begins to look brighter. The Chicago, Burlington & Quincy Railroad will close for about $200,000 worth of equipment soon.

The Columbia Graphophone Co., Bridgeport, Conn., will build a new plant to cost about $3,600,000 near Baltimore, Md.

New York

NEW YORK, Dec. 2.

An enormous quantity of machine-tool business has been placed within the past week with New York dealers and factory representatives, most of this coming from automotive industries. The New Departure Mfg. Co., Bristol, Conn., a subsidiary of the General Motors Corporation, purchased 400 to 500 tools, totaling in value close to $1,000,000, a very large slice of this going to a New York machinery house. About 180 drilling machines, more than 125 lathes and many other tools, including milling machines and grinders, were bought to increase the output of ball bearings at the Bristol plant. Another large buyer was the Willys Corporation, Elizabeth, N. J., whose purchases reached about $500,000. One order for machines of standard type totaled about $150,000, but the remainder of the business was largely in special machines.

The Standard Oil Co. of New Jersey bought $100,000 to $150,000 worth of machine tools and plate-working machines for shipment to Rumanian oil fields. The order for machine tools, amounting to about $100,000, went to one machine-tool dealer. This is the only export business of importance that has been closed in some time. Very little export trade with Europe is being done, but there is a fair demand from the Far East.

The Liberty Starters Co., Poughkeepsie, N. Y., whose recent inquiry for nearly 100 tools was published in THE IRON AGE of November 27, has bought a part of the tools on its list, and will conclude its purchasing within the next week.

Machine-tool sellers describe present conditions as the best they have experienced since the war. Some companies are doing better than a war-time business. November was the best month of the year in many selling offices. As an example of the way business is coming to some of the machine-tool plants it may be stated that a New England manufacturer of lathes last week received orders for 102 lathes, of which 48 were bought by one company. Another order placed in the East by an automobile company was for $100,000 worth of multiple spindle drilling machines.

In addition to the large business that has just been placed, there is considerable buying in prospect, and it is significant that the largest manufacturing companies in their respective lines are undertaking plant expansion or renewals.

The General Electric Co. is issuing additional inquiries for its Schenectady and Lynn works, and some of the tools to be bought will be shipped to its new plant at Decatur, Ind. It is understood that the company will increase its output of small motors. The Western Electric Co., whose executive offices are at 195 Broadway, New York, is passing on a good-sized list of equipment to be bought at Chicago for its Hawthorne, Ill., works. The Blake & Knowles works of the Worthington Pump & Machinery Corporation has issued another inquiry for five or six tools. The American Car & Foundry Co., New York, has bought some equipment in the past week for its Depew, N. Y., plant, and has a new inquiry out for equipment for its Chicago plant, where foreign orders will be executed. The return of the company's president, W. H. Woodin, from Europe, has been followed by evidences of expansion of the company's activities. Likewise the American Locomotive Co. is in the market for additional equipment to execute foreign orders. New tools will be bought for the Montreal plant, where foreign locomotives will be built.

The return of the railroads to their owners January 1 is expected to be followed by buying of shop equipment, but there are few inquiries in the market now. The Pennsylvania Lines West have bought a few tools. Shipbuilders are getting orders for merchant ships, and are buying a few tools. Among those which have made small purchases are the Bethlehem and Union shipyards at Baltimore and the Merchants yard at Bristol, Pa.

C. H. Johannson, Inc., Poughkeepsie, N. Y., has begun the placing of orders for tools needed for a new plant recently occupied. The corporation was formerly known as the Swedish Gage Co.

Canadian companies are coming to New York for equipment, two inquiries having been received in the past week. One is from the Fraser, Brace Shipyards, Ltd., 83 Craig Street West, Montreal, Que., and calls for one oil-heated angle iron furnace, one plate bending roll, two vertical punching machines, six plate punching tables, two single-headed shears, one horizontal punch, three radial countersinking machines, one angle iron cutting machine and an emery wheel. The other inquiry is from the Canadian Ingersoll-Rand Co., Ltd., Sherbrooke, Que., and asks for quotations on one 10x 20 ft. planer, one 16 x 24 ft. vertical extension boring mill, one 7 ft. radial drill and one floor boring mill with 6 in. spindle.

The Keystone Engineering & Equipment Co., a new machine-tool selling concern, has been organized by E. B. Reese and E. O. Haight, formerly with the Dale-Brewster Machinery Co., New York. Mr. Reese is president and Mr. Haight is secretary-treasurer of the new company, which

has opened a temporary office at 320 Fifth Avenue, New York.

The Bethlehem Steel Co. is inquiring for two 10-ton and two 15-ton cranes for Sparrows Point, Md. The Bethlehem company's recent inquiry for 14 cranes for its Lebanon, Pa., plant is not yet closed. J. G. White & Co., New York, are in the market for a 15-ton crane. The Union Shipbuilding Co., Baltimore, is inquiring for 12 cranes, the order for which will be placed in Baltimore. The Woonsocket Foundry & Machine Co., Woonsocket, R. I., has purchased from the Chesapeake Iron Works a 7½-ton crane with 59-ft. span, and the Cadillac Motor Car Co., Detroit, has purchased from the same company a 5-ton crane with 86-ft. span. Chisholm & Moore, New York, have an order for a 15-ton hand power crane from the New Jersey Zinc Co., for its Hazard, Pa., plant.

Export inquiries for cranes are still numerous, but few sales are reported. Inquiries are chiefly from South America, Cuba, Dutch East Indies and Japan, with a few from China for hand power cranes and one or two from Scandinavian countries. With the exception of Norway, Sweden, Denmark and Spain, American manufacturers feel that it is almost impossible to compete with Germany in Europe. One manufacturer is, however, building 12 overhead traveling cranes for Automobiles Berliet, France. Another firm has closed an order through London for six 15-ton, 4-wheel locomotive cranes for 8-ft. gage track, sold probably to the Chilean Government for shipment to Antofagasta, Chile. A Dutch East Indian order has been received by a manufacturer of hand power cranes for a 3000-kilogram crane for use in a power plant.

Lt.-Col. G. P. Mills is here from England to purchase equipment for the manufacture of automobile radiators in England. He represents the Austin Motor Co., whose New York representative is John Grant, Singer Building.

The H. H. Franklin Mfg. Co., Syracuse, N. Y., is figuring on a large quantity of new equipment to increase its output of automobiles.

The Empire City Iron Works, 898 Eighth Avenue, New York, has acquired property on Tenth Street, near Vernon Avenue, Long Island City, comprising about 10,000 sq. ft., for the establishment of a new works.

The Hauck Mfg. Co., 113 Eleventh Street, Brooklyn, manufacturer of oil burners, has completed plans for a two-story building, 75x91 ft., on Tenth Street near Second Avenue, to cost $20,000.

The Singer Sewing Machine Co., 149 Broadway, New York, will build a one-story forge shop, 60x230 ft., at its Bridgeport, Conn., works on Pembroke Avenue, to cost about $40,000.

The Arma Engineering Co., 252 West Twenty-ninth Street, New York, is looking for a site at Perth Amboy, N. J., for a new machine shop, to have about 6000 sq. ft., of floor space, and employ about fifty operatives.

The E. Behringer Sheet Metal Works, 315 East Ninety-seventh Street, New York, is having plans prepared for a one-story shop, 125x150 ft., at Flushing and Wyckoff avenues, Brooklyn, to cost about $50,000 including equipment.

The Columbia Graphophone Co., Woolworth Building, New York, manufacturer of talking machines, motors, parts, etc., has acquired property at Orangeville, near Baltimore, Md., comprising about 100 acres, for a new plant. The Columbia Graphophone Factories Corporation has been organized as a subsidiary to build the new works, which will be the largest of the company's plants, including the present main works at Bridgeport, Conn.; it will be equipped for all features of manufacture with the exception of spring motors, which will be produced at other plants. The new plant is estimated to cost about $3,600,000 and will give employment to 6000 persons. The company has acquired property from the Canadian Government at Toronto, heretofore used for airplane manufacture, for a new plant in this district. This plant will be remodeled and improved for the new manufacture at an estimated cost of $800,000, including equipment. A bond issue has been arranged for $1,750,000 to cover initial expenditures on the projects. Francis S. Whitten is president.

The International Motor Co., Plainfield, N. J., has broken ground for an addition to cost about $15,000.

The Atlas Railway Signal Co., Hoboken, N. J., has been incorporated with a capital stock of $200,000 by M. L. Patterson, C. A. Asmus and M. H. Loughridge, Bogota, N. J., to manufacture railroad signals and devices.

Richard W. Seabury, Rockaway Avenue, Boonton, N. J., has acquired property of the Boonton Rubber Co., Boonton, at a public sale of the Alien Property Custodian. Mr. Seabury, formerly one of the owners, now has full control of the organization, and plans to operate the works at an early date.

The Motor-Compressor Co., 52 Dickerson Street, Newark, N. J., has filed notice of dissolution. E. E. Southworth is secretary.

The American Writing Machine Co., 369 Mulberry Street, Newark, N. J., subsidiary of the Remington Typewriter Co., 374 Broadway, New York, has acquired a five-story building at Central Avenue and Fourth Street, comprising about 50,000 sq. ft. of space for a consideration said to be about $140,000. The new owner will remove its plant to this new location and increase its output.

Pittsburgh

PITTSBURGH, Dec. 1.

The Allegheny Gear Works, Pittsburgh, affiliated with the Allegheny Forging Co., First National Bank Building, has commenced the erection of a one-story plant addition, 80 x 135 ft., at Page and Chateau streets, to cost about $50,000.

The Gerstner Boiler Works, Thirty-ninth Street and Junction Railroad, Pittsburgh, have commenced the erection of an addition, 100 x 220 ft., for increased output. It is operating its McDonald plant at full capacity, having orders on hand for 152 portable boilers for oil-field service, 30 steel locomotive tenders and a Government order for a quantity of steel masts for vessels. The company has increased its capital stock from $100,000 to $200,000 for expansion.

The new plant of the Gearless Motor Corporation, Flavel Street, East End, Pittsburgh, will be equipped for the manufacture of a steam gearless automobile. It is expected to have the works in operation for spring production. The company recently acquired the East Liberty Natatorium, and this structure is being remodeled extensively, with erection of addition, for the plant.

The McClintic-Marshall Co., Pittsburgh, has acquired property aggregating about 65 acres of land fronting on the Ohio River and adjoining its plant at Leetsdale, Pa., for a consideration of about $330,000. This gives the company a total river frontage of about three miles at this location.

The Crescent Refractories Co., Lock Haven, Pa., has been formed with a capital of $1,110,000 by a merger of the George S. Good Fire Brick Co., Lumber City, the Clearfield Mining Co. and the Clearfield Clay Working Co., Clearfield. A. P. Perley, Williamsport, is chairman of the board of directors.

The Rigelon Motor Corporation, Donora, Pa., has completed plans for a two-story automobile service works and machine repair plant, 68 x 100 ft., to cost about $40,000.

The Bessemer Limestone Co., Bessemer, Pa., has been merged with the Bessemer Limestone & Cement Co. The new company is planning for the erection of a cement plant with daily capacity of about 3000 bbl. Joseph G. Butler, Jr., is chairman of the board of directors, and John Todd is president.

The Stoody Machine Co., 713 Second Avenue, Huntington, W. Va., recently organized, is planning for the installation of equipment in a building acquired for its new works, to be used for machine manufacture and repairs. The apparatus will include bolt machine, pipe-threading machine, hammer, sheet-metal rolls, combination punch and shear, etc. W. F. Stoody is manager.

Buffalo

BUFFALO, Dec. 1.

The Farrell Foundry & Machine Co., Ansonia, Conn., has purchased from the Government the "Victory" turbine plant of the Bethlehem Shipbuilding Co. at Vulcan Avenue and the New York Central Railroad, Buffalo, for which it bid $431,000. The plant comprises a main building, 225 x 700 ft., power-plant, office, restaurant, welfare and hospital buildings and 12 acres of land. The Farrell company will establish there a branch plant at which it is stated about 2000 men will be employed.

The Buffalo Steel Car Co., Buffalo, recently incorporated with paid in capital of $80,000, has acquired a site on the New York Central Railroad at Cheektowaga, a suburb, upon which a plant will be erected. J. C. Bradley, R. H. Parks and J. G. Dudley, Fidelity Building, are among the directors.

The Smith Wheel Co., Inc., Syracuse, N. Y., will build a plant addition, 92 x 109 ft., on North Geddes Street, to cost $35,000.

The Buffalo Porcelain Enamel Co., Buffalo, recently incorporated, has commenced construction of a plant to cost $25,000 at Elmwood Avenue and the Erie Railroad. It will manufacture porcelain enameled stove linings and trimmings. Officials of the Buffalo Co-operative Stove Co., the

Jewett Stove Works and the Flexeume Sign Co., Buffalo, are connected with the new enterprise. Frederick H. Williams, 830 Auburn Avenue, is manager.

Plans have been drawn for a one-story machine shop, 200 x 800 ft., to be erected by the Kellogg Mfg. Co., manufacturer of air pumps, Rochester, at an estimated cost of $200,000.

The Sargent & Greenleaf Co., 178 Court Street, Rochester, manufacturer of key blanks, is having plans prepared for factory buildings, 140 x 220 ft., and 40 x 130 ft., one-story, and 40 x 220 ft., two stories, to cost about $200,000.

The Lewis & Weller Mfg. Co., Utica, N. Y., maker of spring beds, etc., will build a plant addition, 39 x 101 ft., two-stories, estimated to cost $15,000.

The International Time Recording Co., Endicott City, N. Y., has plans prepared for a factory addition of reinforced concrete, which it will erect on North Street at an estimated cost of $150,000.

The Bridgeford Machine Tool Wofks, Rochester, N. Y., and the Betts Machine Co., Rochester, formerly of Wilmington, Del., have been merged; the consolidation to be known as the Betts Machine Co. The Bridgeford Machine Tool Works has specialized in building heavy engine lathes and axle lathes for more than 20 years. The Betts Machine Co. has been building heavy-duty machine tools for nearly 60 years.

The Buffalo Foundry & Machine Co., East Ferry Street and Fillmore Avenue, Buffalo, is reported considering the erection of a one-story addition, 40 x 80 ft., to cost about $6,000.

The Lumen Bearing Co., 197 Lathrop Street, Buffalo, will establish a branch plant at Youngstown, Ohio, for specializing in the production of brass castings. It will be equipped for a capacity of about 5,000,000 lb. of castings a year. It is planned to have the first unit in operation early in March. W. H. Barr is president and treasurer; and H. P. Parrock is general manager.

The Jamestown Metal Desk Co., Jamestown, N. Y., has been incorporated with a capital stock of $300,000 by J. H. Dasher, W. R. Reynolds and E. E. Wellman.

The Lakeside Forge Co., Erie, Pa., manufacturer of drop-forged wrenches, etc., is planning for a new forge shop, equipment to comprise 12 hammers and other machinery.

The Miles Electric Car Lock Corporation, Buffalo, has been incorporated with a capital stock of $500,000 by S. Johnston, G. G. Canute and J. R. Kingsley.

Philadelphia

PHILADELPHIA, Dec. 1.

The Wright Roller Bearing Co., 20th Street and Indiana Avenue, Philadelphia, has acquired adjoining property at Twentieth and Cambria streets, 100 x 270 ft.

The General Carbonic Co., 838-44 North Third Street, Philadelphia, has filed plans for a new works to comprise assembly plant, two-story, 48 x 90 ft., one-story power plant, 30 x 93 ft., and other buildings to cost about $30,000.

The Ordnance Department, Washington, will build an addition to the power plant at the Frankford Arsenal, Philadelphia, to cost about $60,000.

M. Boyle, Philadelphia, operating a machine shop at 513 North 61st Street, has filed plans for a one-story addition, 29 x 30 ft.

The Klauder-Weldon Dyeing Machine Co., Jenkintown, Pa., is arranging plans for a general reorganization. The company has been in the hands of a receiver the past few months, and with the settlement of claims of creditors it is proposed to enlarge the plant, install additional equipment and operate on an enlarged scale. W. S. Duell is an official of the company.

The Philadelphia Textile Machinery Co., Sixth Street and Tabor Road, Philadelphia, manufacturer of drying machinery, blowers, etc., has filed plans for a one-story reinforced-concrete addition, 18 x 80 ft.

The Victor Talking Machine Co., Camden, N. J., has commenced the enlargement of its plant. It is planned to have the extensions in operation early in the coming year. Eldridge R. Johnson is president.

The Diamond State Fibre Co., Bridgeport, Pa., has completed plans for a one-story addition, 60 x 520 ft., to be equipped as a machine shop and for general manufacture. It will cost about $75,000.

The Steward Auto Co., 13th and Turner streets, Allentown, Pa., is being organized by Audrey G. Steward, George A. King and William V. Herb. It plans for general enlargement. New machinery with individual motor drive will be installed, as well as equipment for aluminum crank-case work and other apparatus.

The main building at the shipbuilding plant of the Delaware Shipbuilding & Repair Co., Beach and Erie streets, North Camden, N. J., was destroyed by fire Nov. 20, with loss estimated at $20,000.

Fire, Nov. 23, destroyed a section of the plant of the Reading Stove Works, Reading, Pa., with loss reported at $200,000.

The York Body Corporation, York, Pa., manufacturer of automobile bodies, etc., has increased its capital stock from $200,000 to $500,000.

The Bethlehem Motors Corporation, Allentown, Pa., has arranged for an issue of stock securities to net about $1,000,000. The fund will be used in part for works expansion, to increase the production of motor trucks from about 4000 to 8000 a year.

George A. Gumphert & Son Co., Philadelphia, has been incorporated with a capital stock of $20,000 by George A. Gumphert, 5906 Ventnor Avenue, Atlantic City, N. J., and others, to manufacture patterns, molds and models.

Notice has been filed by the American Manganese Mfg. Co., Bullitt Building, Philadelphia, of an increase in indebtedness from $125,000 to $250,000.

The Pennsylvania Forge Co., Wakeling and Bermuda streets, Philadelphia, Pa., has increased its capital stock from $400,000 to $500,000.

Announcement has been issued by officials of the Gray Iron Foundry Co., Reading, Pa., that it will build a foundry addition, 60 x 92 ft., to cost about $22,000.

The Rivetless Chain & Engineering Co., Lebanon, Pa., is expected to add new forging equipment in the spring. John H. Lloyd, 318 Walnut Street, Lebanon, is manager.

The Lycoming Foundry & Machine Co., Williamsport, has purchased a 15-acre property, on which it is planned to construct an additional foundry within the next few years.

The McKneat Mfg. Co., Myerstown, Pa., capitalized at $6,000, has been incorporated by R. H. Brown, Lebanon, L. F. Krum and R. D. Smoyer, Myerstown, to manufacture iron, steel, etc.

A decree of dissolution, effective Nov. 18, 1919, has been issued by the Pennsylvania State Department in the case of the Penn Chain Works, Berks Co., Pa.

New England

BOSTON, Dec. 1.

The past week has witnessed some slowing up in the machine-tool demand. Business has not been dull, however, but buying has been very largely for one or two machines to an individual. Nothing has been done on the few large lists open. One feature of the market is the number of inquiries received daily from which no business results. It is generally felt that these inquiries are made for the purpose of getting a line on the second-hand market, which continues active and strong. Deliveries, especially of lathes, are becoming more extended. Some manufacturers of standard set screws have advanced their prices approximately 20 per cent. A general advance is expected within the next few days. The Hobbs Mfg. Co., Worcester, Mass., has bought additional equipment the past week. The Metz Co., Waltham, Mass., is said to be contemplating the manufacture of automobile parts and in that event will need considerable new equipment. The Sullivan Machinery Co., Clairmont, N. H., has just bought five tools, and is in the market for a small amount of additional equipment. The General Electric Co., Lynn, Mass., continues to buy additional machines against its 1920 requirements, having made purchases the past week. The Mossberg Pressed Steel Corporation, Attleboro, Mass., has just contracted through Boston and Providence houses for considerable equipment. Automobile manufacturers have recently placed substantial orders with the Van Norman Machine Tool Co., Springfield, Mass., for its new high speed grinder. The Sterling Motor Co., Brockton, Mass., is inquiring for special automobile equipment for its new plant at Cleveland, where it intends to move its Brockton outfit. The list of requirements for the Stevens-Duryea Co., Chicopee, Mass., will not be ready for publication within three or four weeks. A permit has been given for the erection of the second unit of its Williamsett plant, which will cover 100,000 sq. ft.

The Boyd Mfg. Co., South Weymouth, Mass., is building a new plant at Taunton, Mass., to manufacture taps and dies for the automobile trade.

The Smith Iron Foundry Co., Lynn, Mass., has decided not to make improvements to its plant until spring, the bids submitted being considered too high.

The Rolls-Royce plant at Springfield, Mass., will include five machine shops, two hardening shops and a testing room.

The Arnold Electric Tool Co., Inc., New Haven, Conn., will increase its capital stock from $25,000 to $800,000 to provide funds to finance its increasing business.

The New Haven Rivet Co., New Haven, Conn., has increased its capital stock from $16,000 to $166,000.

Leigh & Butler, 232 Summer Street, Boston, manufacture of textile machinery and accessories, will move to New Bedford, Mass., and locate in the plant formerly occupied by the Baker Mfg. Co.

A preliminary certificate of dissolution has been filed at Hartford, Conn., by the Penfield Mfg. Co., Meriden, Conn.

The Gilbert & Barker Co., Springfield, Mass., has bought two tracts of land adjoining its property, but no definite plans have been made for their use.

The Cambridge Rubber Co., Cambridge, Mass., has awarded a contract for the erection of an addition to its manufacturing building.

The Screw Machine Products Corporation, Providence, R. I., has increased its capital stock from $100,000 to $150,000.

The Oakville Co., Waterbury, Conn., manufacturer of metal pins, clips, etc., will build a new two-story, concrete and steel power plant, 40 x 50 ft.

The Master Tool Co., Providence, R. I., has been incorporated with a capital of $25,000 by Joseph Duplessie and Henry C. Hart, Providence; and William D. Grady, Woonsocket, R. I.

The Cambridge Rubber Co., Cambridge, Mass., has awarded a contract to the James E. Nelson Co., Boston, for the erection of a four-story, brick addition, 74 x 90 ft., to cost about $50,000.

The Hartford Special Machinery Co., Homestead Avenue, Hartford, Conn., has arranged for the immediate erection of a one-story addition, 60 x 200 ft.

The William H. Haskell Mfg. Co., 24 Commerce Street, Pawtucket, R. I., manufacturer of expansion bolts, etc., has had plans prepared for a two-story addition, 85 x 150 ft., to cost about $75,000. John A. Arnold is president.

Baltimore

BALTIMORE, Dec. 1.

The Baltimore Copper Smelting & Rolling Co., Canton, Baltimore, will build two one-story additions, 11 x 36 ft., and 13 x 65 ft.

The A. Weiskittel & Son Co., Twelfth and Lombard streets, Baltimore, manufacturer of stoves, etc., will build an additional structure, one-story, 30 x 40 ft.

The Automatic Repair Co., 209 East Lafayette Avenue, Baltimore, has been incorporated with $10,000 capital stock to repair automobiles, etc. The incorporators are F. Eugene Sloan, Theodore H. Ascherfeld and Forest Bramble.

Reus Brothers, Baltimore, manufacturers of metal products, have acquired land on Wabash Avenue, near Grantly Street, as site for its proposed plant for the manufacture of automobile parts.

The Automotive Tractor Co., Fredericks, Md., is taking bids for a one-story machine shop and foundry on B. & O. Avenue, to cost about $50,000, including equipment. G. L. Schofield is president.

The plant of the Somerset Highland Foundry & Machine Co., Somerset, Md., was destroyed by fire, Nov. 22, with loss estimated at $30,000.

The Avon Specialties Co., 1508 Madison Avenue, Baltimore, has been organized by William L. Thaxton and S. T. Carrigan, to manufacture automobile parts and metal products.

The Southern Textile Machinery Co., Greenville, S. C., is planning for the erection of a three-story plant addition, 55 x 120 ft. J. E. Sirrine, Greenville, is the architect.

Plans are reported to be under way for a merger of the Crawford Automobile Co. and the Maryland Pressed Steel Co., both of Hagerstown, Md., the latter a subsidiary of the Poole Engineering & Machine Co., Baltimore. With the completion of the merger, it is proposed to develop the manufacture of automobiles, including pleasure cars and heavy trucks, using the present Maryland company works and the Crawford plant for this purpose. During the war period, the Maryland Pressed Steel Co. devoted its output to shells.

The Chatham Flue Valve Co., Chatham, Va., has been incorporated with a capital stock of $15,000 by R. L. Neal and J. J. Patterson.

The Southern Machinery & Supply Co., First National Bank Building, Roanoke, Va., will receive prices on second-hand, 6 to 10-ton electric traveling cranes with 50 to 60-ft. span.

The Portsmouth-Norfolk Ferry Co., Portsmouth, Va., plans to build a shop for repair work.

The Cathcart Machinery Co., Alexandria, Va., has been organized with $100,000 capital stock. S. M. Newton is president; and A. L. House, secretary.

The Kentucky & West Virginia Power Co., Logan, W. Va., will build a boilerhouse to be equipped with six 1000-hp. boilers.

The Southern Textile Machinery Co., Greenville, S. C., will build a plant addition, 57 x 117 ft.

The Oglesy Granite Co., Elberton, Ga., is interested in quotations on 5 to 10-ton traveling cranes with 20 to 40-ft. boom.

E. T. Roux & Son, Plant City, Fla., desire quotations on lath mills and bolters.

Detroit

DETROIT, Dec. 1.

The Puritan Machine Co., Detroit, has purchased a building at Eighth and Fort streets which it will equip as a gear and machine shop.

The Flint Pattern & Foundry Co., Flint, Mich., has taken out a permit to build a plant, 40 x 100 ft., at a cost of $8000.

Two new screw machines a week are being installed in the plant of the Mueller Metals Co., Port Huron, Mich. There are 24 now in operation, but the company is unable to keep up with orders.

The General Engineering Co., headed by John Lundberg, formerly of the Bay City Industrial Works, Bay City, Mich., is erecting a two-story building, 70 x 80 ft., at Alpena, Mich. The company will at first do a general foundry and machine shop business. Operations will start about January 1.

Plans for the addition of a foundry to the plant of the Superior Steel Co., Benton Harbor, Mich., to cost $200,000, have been announced.

Manning, Maxwell & Moore, Inc., New York, owner of the Shaw Crane Works, Muskegon, Mich., will soon begin the erection of a plant to manufacture farm gas engines and machine tools. Three main buildings, including a foundry, will be erected, estimated to cost about $2,000,000 with equipment. It is planned later to make farm lighting systems.

A permit has been taken out by the American Gear & Mfg. Co., Jackson, Mich., for the erection of a new factory, 169 x 280 ft., to cost $180,000.

The Advance Pump & Compressor Co., Battle Creek, Mich., which was prevented from expanding by the war, is now doubling its capacity. The machine shops, power house, testing room, blacksmith shop and warehouse are nearly completed, and the foundry will be ready for operation in two weeks.

The Steel Age Mfg. Co., Battle Creek, Mich., has increased its capital stock from $100,000 to $250,000.

The General Aluminum & Brass Mfg. Co., Detroit, has purchased the plant of the United Fence Co., South Military Street, Port Huron, Mich., which it is equipping for the manufacture of aluminum castings and brass bushings.

Cleveland

CLEVELAND, Dec. 1.

Automobile manufacturers have completed the round lot buying of machinery for their 1920 production and orders from this source are now for small lots and single machines. Business in the aggregate is holding up well. With the unsettled labor situation, higher costs of material and uncertainty as to the cost of building machines for delivery several months ahead, for which orders are now being taken, the question of advancing prices is receiving serious consideration. In the past week two manufacturers, one of lathes and the other shapers, advanced prices 10 per cent. Some makers of small tools have also made similar advances.

The Hydraulic Pressed Steel Co., Cleveland, has announced plans for reorganizing and refinancing subject to the approval of its stockholders, which will result in the merger of the company and its subsidiaries under the name of the Hydraulic Steel Co., with an authorized capital stock of $6,000,000 of 7 per cent preferred stock, and 200,000 no par common shares. The subsidiaries include the Cleveland Welding & Mfg. Co., Hydraulic Steelcraft Co., Cleveland, and the Canton Sheet Steel Co., Canton, Ohio. The Hydraulic company, in addition to its other products, will shortly begin the manufacture of steel barrels.

F. W. Ruggles, president Republic Motor Truck Co., Inc., Alma, Mich., John M. Willis, and W. J. Baxter, New York, have acquired control of the Republic Motor Truck Co. and the Torbensen Axle Co., Cleveland. The men whose holdings were purchased include Charles G. Rhodes, former secretary of the Republic company, C. F. Hepburn, former vice-president and general manager, and J. O. Eaton, president Torbensen Axle Co.

The Firestone Tire & Rubber Co., Akron, Ohio, will build a new plant in Hamilton, Ont., under the name of the Firestone Tire & Rubber Co. of Canada, Ltd. It has been formed with a capital stock of $5,000,000.

The State Foundry Co., Akron, Ohio, contemplates building a plant, 80 x 100 ft.

The Goodyear Tire & Rubber Co., Akron, Ohio, is planning the erection of a five-story machine shop, 160 x 520 ft.

The Standard Wire & Spring Co., Bonna Avenue, Cleveland, Ohio, contemplates the erection of a two-story factory, 90 x 145 ft.

The General Fire Extinguisher Co., Warren, Ohio, will erect a new gray iron foundry 100 x 280 ft., one story with a mezzanine floor covering the greater part of the structure. Complete equipment will be required. Plans are being prepared by the H. M. Lane Co., engineer, Detroit.

The Columbia Tire & Rubber Co., Columbiana, Ohio, will build a new plant in Mansfield, Ohio, for the manufacture of tires.

The Lima Drill Press Co., Lima, Ohio, has been incorporated with a capital stock of $150,000 to build multiple spindle drilling machines. It will establish a plant at 120 East Spring Street.

The Lima Sheet Metal Products Co., Lima, Ohio, is planning the erection of a new works.

Chicago

CHICAGO, Dec. 1.

The problem of deliveries, already acute, will be rendered more difficult if machine tool manufacturers are forced to reduce or suspend production on account of the coal shortage. One important manufacturer in this district has already curtailed its output and it is feared that others will soon have to do likewise. Delivery is the one limiting factor in the sale of machinery at present. Notwithstanding this, however, dealers report an excellent aggregate business, largely made up of small individual orders. Often the sale of one or two machines, when of the heavy type, involves a considerable sum of money. The Beloit Iron Works, Beloit, Wis., for instance, is about to close for a 60 in. planer and a 62 in. boring mill which will cost from $20,000 to $25,000.

The motor industry continues prominent among purchasers of tools. The Lafayette Motors Co., Indianapolis, has bought six hand screw machines. The Continental Motors Co., which is adding materially to its manufacturing facilities at Muskegon, Mich., has purchased several hundred thousand dollars worth of tools in the last few months.

The General Electric Co. will erect a large plant at Decatur, Ind., and will be in the market for machine tool equipment. The Chicago, Burlington & Quincy Railroad expects to close for $200,000 worth of machinery in the near future.

The Playerphone Talking Machine Co., 338 North Kedzie Avenue, Chicago, is having plans prepared for a three-story factory, 157 x 165 ft., in Lake Street, near Kildare Avenue, at a cost of $100,000.

The American Foundry & Equipment Co., 2931 West Forty-seventh Street, Chicago, has awarded contracts for the construction of a one-story factory and foundry, 100 x 300 ft., to cost $160,000.

The Vaughan Novelty Mfg. Co., manufacturer of advertising specialties, 711 Fulton Street, Chicago, is receiving bids through an architect on a one-story plant, 100 x 100 ft., to be erected at 3209-3217 Carroll Avenue at a cost of $25,000.

The Cadillac Motor Car Co. has awarded contract for the construction of a six-story automobile repair shop, 100 x 160 ft., at the southwest corner of Indiana Avenue and Twenty-third Street, Chicago, to cost $400,000.

The Mechanical Mfg. Co., Thirty-ninth and Loomis streets, Chicago, has awarded contracts for the erection of a three-story plant, 52 x 126 ft., on its present site, to cost $60,000.

J. C. McFarland, 2701 South Wells Street, Chicago, has let contract for the construction of a one-story factory and machine shop, 100 x 120 ft., at 3545-3551 Parnell Avenue.

The Joseph F. Kiesler Co., manufacturer of machinery, 929 West Huron Street, Chicago, has let contract for the erection of a one and two-story plant, 69 x 75 ft., at 929-935 West Superior Street, to cost $13,500.

The Rock Island Stove Co., Rock Island, Ill., contemplates the erection of a plant, 50 x 144 ft.

The World Phonograph Co., 736-738 Tilden Street, Chicago, has purchased a four-story factory on the South Side comprising over 150,000 sq. ft. of floor space. It is not expected that it can move until early spring on account of necessary remodeling. When the addition is ready an increased output of at least 200 phonographs per day is expected. Frank Baackes, vice-president American Steel & Wire Co., is president; J. P. Sherlock, president Illinois Nail Co., is vice-president; Ernest C. Cook is secretary and general manager; Karl Baackes is treasurer, and A. J. Harris, president Janesville Barbed Wire Co., and F. E. Morton, manager acoustic department American Steel & Wire Co., are additional directors.

The Advance Machinery Co., 4645 Ravenswood Avenue, Chicago, is taking bids for the erection of a one-story addition, 58 x 100 ft.

Fire, November 18, destroyed the machine shop of the St. Louis, Troy & Eastern Railroad, National City, Ill., with a loss estimated at $18,000.

The Continental Can Co., 111 West Washington Street, Chicago, has completed plans for the erection of a new plant on Ashland Avenue, near Thirty-eighth Street, to cost about $200,000.

The Diamond Calk Horseshoe Co., Duluth, Minn., has had plans prepared for the erection of a one-story addition, 50 x 120 ft., at Third Street and Fifty-seventh Avenue, to cost about $25,000. Otto Swanstrom is president.

Fire, November 18, destroyed the plant of the International Harvester Co., Dubuque, Iowa, with loss estimated at $200,000.

The Northwestern Iron Works, Devils Lake, N. D., is planning for the erection of new works to include machine and forge shops, foundry, welding and other departments. Samuel A. Hann is president.

Indianapolis

INDIANAPOLIS, Dec. 1.

The Parts Corporation, Indianapolis, has been incorporated with $25,000 capital stock to manufacture automobile accessories. The directors are Bernard E. Griffey, Bert F. Kelley and Robert F. Miller.

The Lorraine Car Co., Richmond, Ind., has issued $150,000 of preferred stock.

The American Iron & Metal Co. is a new corporation at Hammond, with $10,000 capital stock. The directors are Samuel Abalman, John A. Gavit and James K. Stinson.

The General Electric Co., Schnectady, N. Y., will establish a branch plant at Decatur, Ind., where the Industrial Association of the city has bought 7.54 acres as a site for a one-story factory 200 x 300 ft. Small motors will be made and it is expected to have the plant in operation by March 1.

The Wolff Mfg. Co., manufacturer of plumbing supplies, 225 North Hoyne Avenue, Chicago, will erect a plant in Hammond, Ind., to cost $100,000. The first unit will be two stories, 100 x 168 ft.

The Simple Lock Rim Co., Petersburg, Ind., has been incorporated with $100,000 capital stock to manufacture demountable automobile rims. The directors are John McM. Loveless, C. C. Walton and S. R. Clark.

The Indiana Aluminum Utensil Co. has been incorporated at Elkhart, Ind., with $400,000 capital stock to manufacture aluminum articles. The directors are Carl D. Greenleaf, John I. Liser and James A. Bell.

The Quality Tire & Rubber Co., Anderson, Ind., has increased its capital stock from $750,000 to $5,000,000.

The Johnson Brothers Engineering Co., South Bend, Ind., has been incorporated with $100,000 capital stock to manufacture machinery. The directors are Louis J. Johnson, Clarence L. Johnson and Harry L. Johnson.

The Ross Gear & Tool Co., Lafayette, Ind., has been reorganized under the name Fairfield Mfg. Co. and will occupy the property of the Lafayette Engineering Co. The capital stock is $150,000.

St. Louis

ST. LOUIS, Dec. 1.

The Lambe & Demarke Water & Light Co., Arkansas City, Ark., is in the market for oil engines and other equipment.

The American Bakers' Machinery Co., Ninth and Clinton streets, St. Louis, will erect a new plant with 60,000 sq. ft. of floor space.

The Burns Tool Co., Okmulgee, Okla., F. G. Irvine, manager, is in the market for screw making and other machinery including lathes, milling machines, shapers, threading machines, steam hammers, etc.

The Shreveport Producing & Refining Co., Shreveport, La., E. R. Bernstein and others interested, will build a refinery with a daily capacity of 6000 bbl., and add units up to 15,000 bbl. A pipe line with pumping machinery, etc., will be laid from the Homer fields to the plant. The company has a capital stock of $10,000,000.

The St. Louis Metal Ware Co., St. Louis, R. L. Niedringhaus, president, will equip a new plant, 220 x 360 ft. for the manufacture of metal products and automobile bodies.

The Louisiana Steel Co., Shreveport, La., has been organized with a capital stock of $10,000,000 by Colonel L. P. Featherstone, Beaumont, Tex., and other officials of the Texas Steel Co., and is planning for the construction of works at Shreveport, to be furnished with iron ore from recently acquired properties in Texas. A plant will also be established at the latter place.

The Newell Sanders Plow Co., Chattanooga, Tenn., is contemplating the erection of additions to double its present output. Newell Sanders is president.

The Union Machine Co., 977 Logan Street, Louisville, Ky., is planning for the erection of an addition to its plant, and will install new machine tools and other equipment. The company recently increased its capital stock. Joseph A. Ganz is manager.

The Acme Oil & Drill Co., Shreveport, La., is planning for the establishment of a new plant for the manufacture of well-drilling tools and kindred specialties. The new works will be equipped with drop forge apparatus, power hammers, heating furnaces and other equipment. J. D. Pace is president.

The Byron Engineering Works, Louisville, Ky., recently organized, has acquired about two acres for the erection of a plant for the manufacture of tractor trailers, estimated to cost $500,000, with equipment. Plans are now being prepared. O. E. Byron is vice-president and Walter McGowan, secretary-treasurer.

The Chandler Welding & Machine Co., Texarkana, Ark., operating a local plant, has been incorporated with a capital of $25,000 for expansion. It will install new equipment to increase the capacity. M. B. Chandler is president.

The Joplin Supply Co., Joplin, Mo., F. C. Ralston, manager, will erect garage and service station to cost $150,000 and will require machine tools, electric motors and other equipment.

The Miami Traction Co., Miami, Okla., B. B. Tatum president, will rebuild its power plant at a cost of about $75,000 for machinery.

The Whitney Milling Machine Co., St. Louis, Hugh Whitney, Webster Groves, Mo., president, will erect a plant, at a cost of $100,000, for the manufcture of tools.

The Caddo Central Oil & Refining Co., Shreveport, La., C. C. Clayton, manager, will equip a refinery, with a daily capacity of 5000 bbl., at a cost of about $1,000,000.

The Kant-Break Spark Plug Co., St. Louis, has acquired a three-story building which it will equip for the manufacture of gasoline spark plugs.

J. D. Pace, of the Acme Oil & Drill Co., Shreveport, La., will install drop forging equipment, heating furnaces and power hammers.

The American Brake Co., St. Louis, 1900 North Broadway, will build an addition to be used as a machine shop, to cost about $325,000.

Milwaukee

MILWAUKEE, Dec. 1.

It is reported that the Seaman Body Corporation, Milwaukee, is planning to build a complete new plant at Port Washington Road and Lake Street, for the manufacture of automobile bodies. The company was formed recently as a reorganization of the W. S. Seaman Co., operating factories at 480 Virginia Street and 233 Clinton Street. The proposed new factory will be 420 x 720 ft., of brick and steel, and cost about $1,500,000. The first unit will be 180 x 420 ft. Harold S. Seaman is secretary.

The Lutter & Gies Co., 258 Lake Street, Milwaukee, manufacturer of tools and machinery, sustained an estimated loss of $30,000 to $35,000 by fire in its main machine shop on November 27. Repairs and replacements will be made immediately.

The Trane Co., Detroit, Mich., will build a two-story branch factory in La Crosse, Wis., to cost $35,000 with equipment. It will be two stories, 68 x 80 ft. and equipped for making radiator traps, centrifugal pumps and other parts for Trane vacuum heating systems. Reuben N. Trane is president and general manager.

The Mueller & Son Co., Milwaukee, through Cahill & Douglas, consulting engineers, is taking bids for a 250-kw. generator and 61 motors of various sizes for the electrification of its wooden box and flooring factory at 361 Canal Street. F. H. Parker is president.

The Hamilton-Beach Mfg. Co., Racine, Wis., manufacturer of industrial and domestic labor-saving devices with electric motors, is taking bids for the erection of a three-story brick and concrete addition, 60 x 400 ft., to cost about $200,000 with equipment.

The Boggis-Johnson Electric Co., 346 East Water Street, Milwaukee, has increased its capital stock from $25,000 to $40,000. It manufactures and repairs electrical equipment.

The Ozaukee Heater Co., Port Washington, Wis., contemplates the addition of a gray iron foundry costing about $20,000 to furnish its own casting for its line of oil-burning water heaters.

The Samson Tractor Co., Janesville, Wis., will convert the plant formerly occupied by the Janesville Machine Co., now consolidated with the Samson works, for the production of a nine-passenger farm car and a farm truck. The foundry will be doubled in size at once. About $200,000 will be invested in alterations, additions and equipment. J. A. Craig is general manager.

The Ogren Motor Car Co., Milwaukee, is starting quantity production of passenger automobiles in the building at 602-612 National Avenue, which provides 35,000 sq. ft. Adjacent land has been purchased for an addition, 100 x 150 ft. to be erected early next year. Hugo W. Ogren is secretary-treasurer and general manager.

The Northern Corrugating Co., Green Bay, Wis., has completed a shop addition at a cost of $90,000 and is having plans prepared for a second unit, two stories, 100 x 100 ft., to be erected early next spring. H. W. Krueger is president.

The Pacific Coast

SEATTLE, Nov. 25.

The Parmelee Boiler Co., Seattle, has purchased a site at 545 Railroad Way, where a plant will be built for the manufacture of its sectional water tube boilers.

The F. S. Lang Co., Seattle, stove manufacturer, will construct a one-story addition 30 x 125 ft. to its plant. Some new equipment will be installed.

It is reported that Erick Hudson, Everett, Wash., with associates, plans the establishment of a paper and pulp mill at Squamish, to cost about $1,000,000, and a hydro-electric plant to cost $500,000.

Plans for the plant of the Harris Mfg. Co., Walla Walla, Wash., manufacturer of tractors and agricultural implements, are nearing completion and provide for a two-story main building and foundry.

The repair shop of the Pacific Power & Light Co., Astoria, Ore., was recently destroyed by fire with a loss of $20,000.

The Petersburg City Council, Alaska, has acquired a site for a hydro-electric plant with a daily capacity of 5000 horse-power. It will be built immediately at a cost of $75,000.

The Kroyer Tractor Mfg. Co., Stockton, Cal., recently incorporated, is planning for the erection of works for the manufacture of tractors, to cost in excess of $1,000,000. About 80 acres have been acquired. The plant will have an initial capacity of about 1,500 machines per annum. J. M. Kroyer is president.

Canada

TORONTO, Dec. 1.

The Imperial Steel & Wire Co., Collingwood, Ont., has appointed P. C. Palin, architect, for the erection of a new plant. J. M. Currie is president.

The Brunswick-Balke Collender Co., of Canada, Hanna Avenue, Toronto, has purchased a site at Woodstock, Ont., and will erect a manufacturing plant to cost $200,000.

The H. A. Wood Mfg. Co., Royal Bank Building, Toronto, has secured a building at Belleville, Ont., and will install machinery for the manufacture of auto valves, etc. It is in the market for brass working machinery.

The Prest-O-Lite Co., Toronto, has purchased 10 acres on Bathurst Street, Toronto, where it will start work at an early date on the erection of a manufacturing plant.

The National Acme Co., 278 DeCourcelle Street, Montreal, will build a factory addition to cost $50,000.

The Anglin-Norcross Co., 65 Victoria Street, Montreal, has the general contract for a plant addition for the Steel Co. of Canada, 1272 Notre Dame Street West, Montreal, to cost $150,000.

D. J. McKay, 2056 Retallack Street, Regina, Sask., has the contract for a plant for the Western Implement & Supply Co., Eighth and Broad streets, to cost $15,000.

The Great Lakes Pulp & Paper Co., Port Arthur, Ont., will start work immediately on a plant to cost about $5,000,000. The engineer in charge of construction will be Hardy Ferguson, 200 Fifth Avenue, New York. Power from the hydroelectric plant at Nipigon will be used, from 12,000 to 16,000 hp., being contracted for delivery by Dec. 31, 1920. Among those interested are Lewis L. Alsted, Appleton, Wis.; George Seaman, Chicago, Ill., and James Whalen, Port Arthur.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	3.37c. to 4.00c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.52c. to 3.62c.
1 to 6 in. x ⅜ to 1 in	3.52c. to 3.62c.
1 to 6 in. x ¼ to 5/16	3.62c. to 3.72c.
Rods—⅝ and 11/16	3.42c. to 3.67c.
Bands—1½ to 6 x 3/16 to No. 8	4.22c. to 4.32c.
Shapes:	
Beams and channels—3 to 15 in.	3.47c.
Angles:	
3 in. x ¼ in. and larger	
3 in. x 3/16 in. and ⅛ in.	3.72c. to 3.97c.
1½ to 2½ in. x ⅛ in.	3.52c. to 3.77c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 3.72c.
1 to 1¼ in. x 3/16 in.	3.52c. to 3.77c.
1 to 1¼ in. x ⅛ in.	3.57c. to 3.82c.
⅞ x ⅞ x ⅛ in.	3.62c. to 3.87c.
¾ x ⅛ in.	3.67c. to 3.92c.
⅝ x ⅛ in.	4.07c. to 4.72c.
½ x 3/32 in.	5.17c. to 5.42c.
Tees:	
1 x ⅛ in.	3.87c. to 4.12c.
1¼ in. x 1¼ x 3/16 in.	3.77c. to 4.02c.
1½ to 2½ x ¼ in.	3.57c. to 3.82c.
1½ to 2½ x 3/16 in.	3.57c. to 3.82c.
3 in. and larger	3.52c

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	3.37c. to 3.62c.
Toe calk, ½ x ⅜ in. and larger	4.25c.
Open-hearth spring steel	6.00c.
Standard cast steel, base price	14.00c.
Extra cast steel	18.00 to 20.00c.
Special cast steel	23.00 to 25.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c.

Sheets

Blue Annealed

	Per lb.
No. 10	4.82c. to 5.80c.
No. 12	4.87c. to 5.85c.
No. 14	4.92c. to 5.90c.
No. 16	5.02c. to 6.00c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	6.05c. to 6.80c.	——
Nos. 22 and 24	6.10c. to 6.85c.	7.30c.
No. 26	6.15c. to 6.90c.	7.35c.
No. 28	6.25c. to 7.00c.	7.50c.
No. 30	6.45c. to 7.20c.	——

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	6.60c. to 8.10c.
No. 16	6.75c. to 8.25c.
Nos. 18 and 20	6.90c. to 8.40c.
Nos. 22 and 24	7.05c. to 8.55c.
No. 26	7.20c. to 8.70c.
No. 27	7.35c. to 8.85c.
No. 28	7.50c. to 9.00c.
No. 30	8.00c. to 9.50c.

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

Base Price* on No. 9 Gage and Coarser	Per lb.
Bright basic	5.50c.
Annealed soft	5.50c.
Galvanized annealed	6.00c.
Coppered basic	6.00c.
Tinned soft Bessemer	7.50c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

Base Price	
High Brass Sheet	31c.
High Brass Wire	31c.
Brass Rod	30c.
Brass Tube	43½c.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 32c. per lb. base.

Cold rolled, 14 oz. and heavier, 1½c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb.	$9.30	$9.05
		90 lb.	9.40	9.15
		100 lb.	9.50	9.25
IC $15.00	$13.00	IC	10.00	9.75
IX 17.25	15.00	IX	11.25	11.00
IXX 19.00	16.75	IXX	12.25	12.00
IXXX 20.75	18.50	IXXX	13.25	13.00
IXXXX 22.25	20.25	IXXXX	14.25	14.00

Terne Plates

8-lb. Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	56c. to 56½c.
Bar	62c. to 65c.
American pig, 99 per cent	56c. to 58c.

Copper

Lake Ingot	20 c. to 21 c.
Electrolytic	19½c. to 20 c.
Casting	19 c. to 19½c.

Spelter and Sheet Zinc

Western spelter	8¾c. to 9c.
Sheet zinc, No. 9 base, casks	12½c.; open 13c.

Lead and Solder*

American pig lead	7¼c. to 7½c.
Bar lead	7¾c. to 8c.
Solder ½ and ½ guaranteed	37c.
No. 1 solder	33c.
Refined solder	28c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb	50c.

Antimony

Asiatic	9½c. to 10c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. 33c. to 35c.

Old Metals

The market is lower and business is very dull. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	16.00
Copper, heavy and wire	15.00
Copper, light and bottoms	13.00
Brass, heavy	9.50
Brass, light	6.75
Heavy machine composition	14.50
No. 1 yellow rod brass turnings	9.00
No. 1 red brass or composition turnings	12.00
Lead, heavy	5.50
Lead, tea	4.00
Zinc	5.00